PHOTOFACT* FOLDER SET

*TRADE MARK

NO. 121

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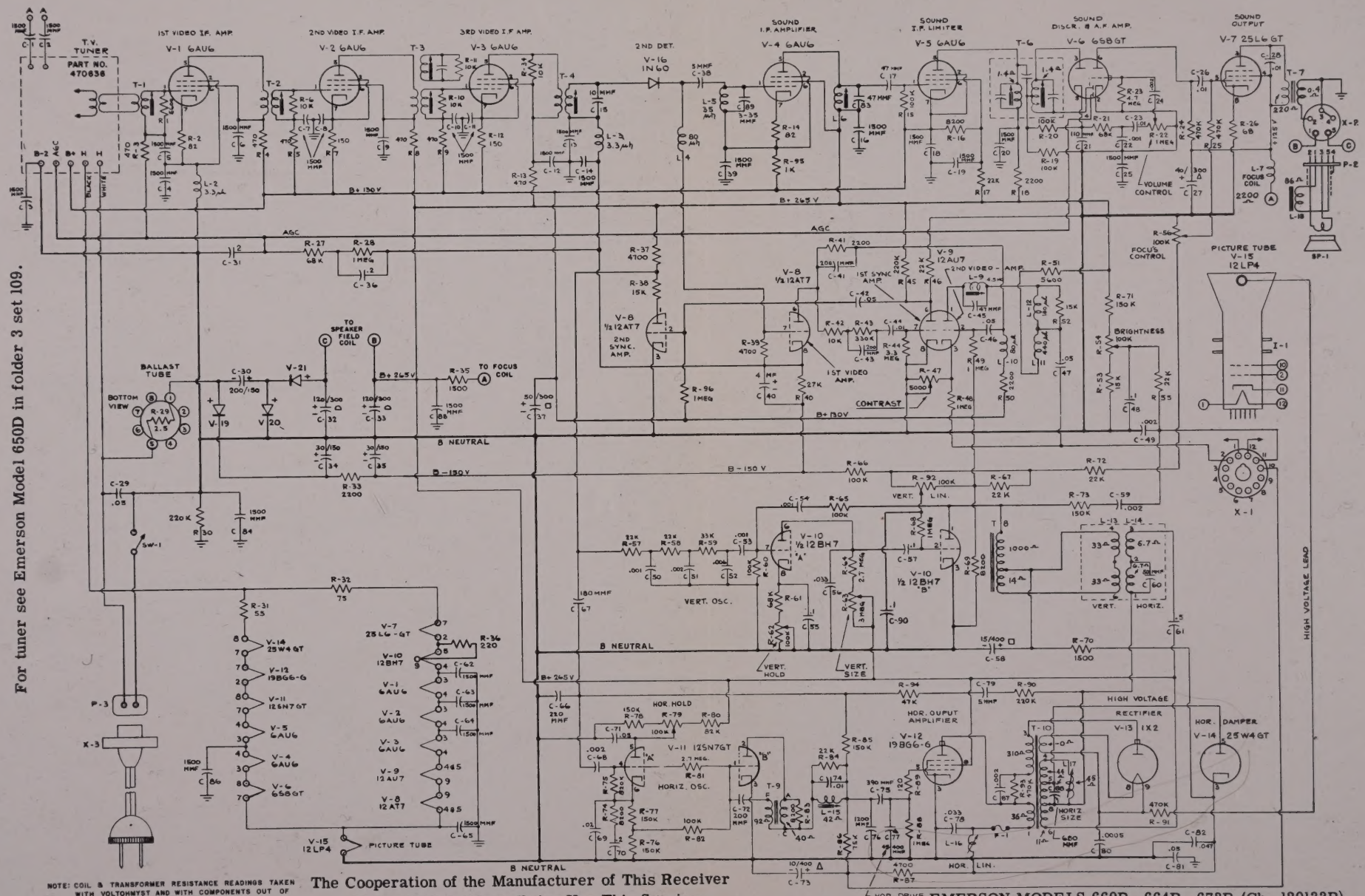
The suffix letter "A," following the Folder number, indicates a "Preliminary Data Folder," designed to provide immediately data on television receivers—pending coverage in standard PHOTOFACT Form.



For tuner see Emerson Model 650D in folder 3 set 109.

NOTE: COIL & TRANSFORMER RESISTANCE READINGS TAKEN WITH VOLTOHMYST AND WITH COMPONENTS OUT OF CIRCUIT.

The Cooperation of the Manufacturer of This Receiver Makes It Possible to Bring You This Service.

EMERSON MODELS 660B, 664B, 673B (Ch. 120133B)

PRODUCTION CHANGES ON EMERSON MODELS 660B, 664B, 673B (Ch.120133B)

Sets coded Triangle 1 have the following changes incorporated to reduce the effects caused by station modulation variation and to make tuning easier.

1. R-16 (8200 ohms), R-17 (22K ohms) R-95 (1K ohms), C-19 (1500MMF.) are removed from the circuits.
2. The junction of C-20, R-18 and T-6 is connected to Pin 6 of V-5 (6AU6) by means of a jumper wire.
3. The value of R-18 has been changed from 2200 ohms to 68K ohms, 1/2 watt.
4. All leads to junction of (L-5, C-89), C-39, R-14 and Pin 2 of V-4 are disconnected from one another and rewired as follows:

   Note: L-5 and C-89 are left connected to one another.

   a) R-14 (82 ohms) is wired to B+ (130 volt line).

   b) Pin 2 of V-4 (6AU6) is wired to Pin 7 of the same tube.

   c) C-39 (1500MMF.) is wired to Pin 7 of V-4.
5. The following components have been added.

   a) A 1 megohm, 1/2 watt resistor from Pin 1 of V-5 to junction of L-5, C-89.

   b) A .01 MF., 200 volt condenser from junction L-5, C-89, 1 meg. to Pin 7 of V-4 (6AU6).

   c) A 33K ohm, 1 watt resistor from Pin 6 of V-8 (12AT7) to B+ (265 volt line).

Sets coded with Triangle 2 have a .001MF., 600 volt condenser from Pin 6 of 6S8GT to B neutral. The body of this condenser is dressed close to the rear of the tuner unit.

Sets coded Triangle 3 have the following changes incorporated to facilitate sound alignment.

1. C-3 has been changed from 1500MMF. to .005MF ceramic.
2. R-14 has been changed from 82 to 150 ohms 1/2 watt.
3. A 150 ohm 1/2 watt resistor has been inserted between Pin #2 of V-5 and B+ 130 volts.
4. A 470 ohm 1/2 watt resistor has been added from B+ 265 volt line to lug where L-6 is connected.

The following wiring changes have been made.

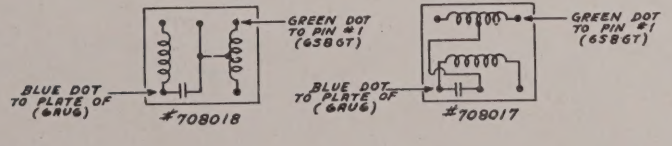
1. The 265 volt lines connected between dummy lug near V-5 and L-6 and also between L-6 and dummy lug near speaker socket have been removed.
2. A new 265 volt line has been added between dummy lug near V-5 and dummy lug near speaker socket.
3. The wire going from Pin #2 of V-5 has been removed from C-37 (50MFD. 300volt) and connected to B+ 130 volt point on dummy lug near V-5.

Sets coded Triangle 4 have the following changes:

1. C-80 (.0005MF.,10KV) condenser has been removed.
2. C-87 has been changed from .002MF., 600 volts to .002MF., 1600 volts.
3. R-91(470K ohms)has been removed and the high voltage lead connected directly to Pin #9 of V-13 (1X2).
4. Pigtail of R-93 has been removed from junction.
5. R-93 has been changed from 470K ohms to 940K ohms which is actually composed of R-93 (470K ohms) and R-91 (470K ohms) in series.

In production, two types of discriminator transformers are used. Electrically these transformers are identical, the difference being in the mechanical layout of the coils.

Chassis using part #708017 are coded with the letter S inside the code triangle. The secondary slug of this transformer is located underneath the chassis.



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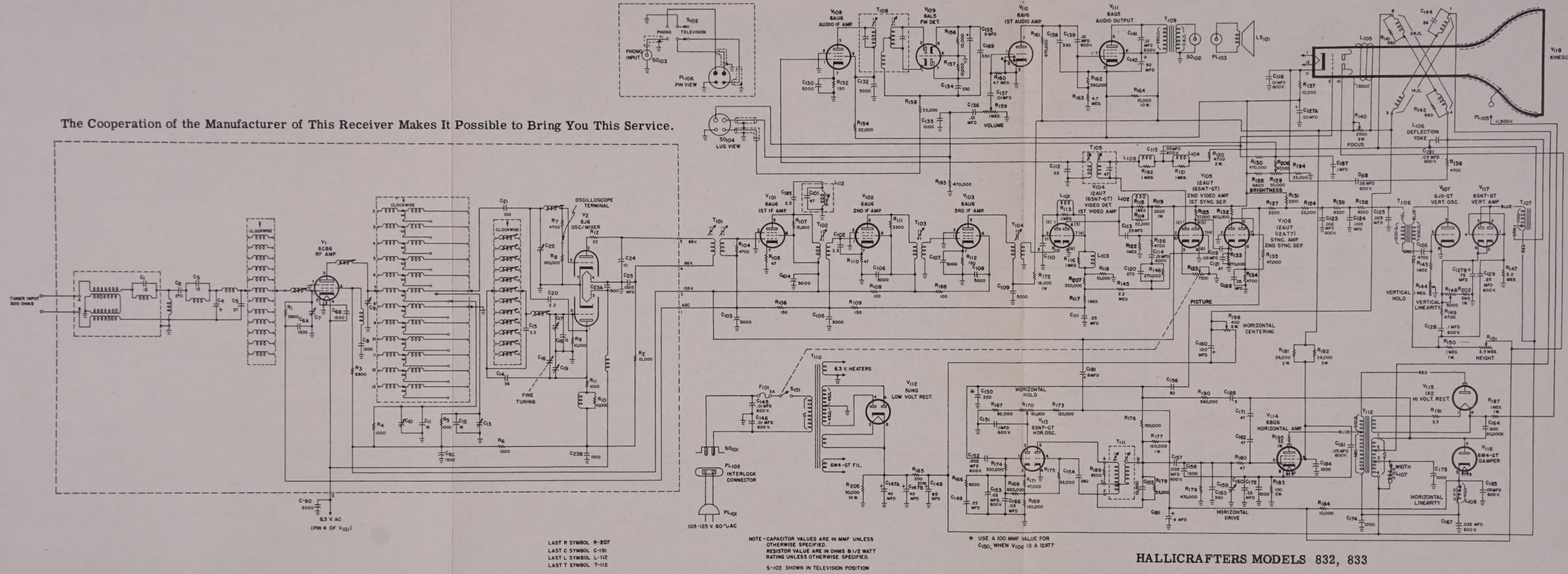

LAST R SYMBOL R-207
LAST C SYMBOL C-191
LAST L SYMBOL L-112
LAST T SYMBOL T-112

NOTE—CAPACITOR VALUES ARE IN MMF UNLESS OTHERWISE SPECIFIED.
RESISTOR VALUE ARE IN OHMS & 1/2 WATT RATING UNLESS OTHERWISE SPECIFIED.

S-102 SHOWN IN TELEVISION POSITION

* USE A 100 MMF VALUE FOR C_{150}, WHEN V_{106} IS A 12AT7

HALLICRAFTERS MODELS 832, 833

PRELIMINARY DATA
The data contained in this folder is published in advance of regular PHOTOFACT Coverage

SET 121 FOLDER 1A

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AIRCASTLE
MODEL 5044

AIRCASTLE
MODEL 5044

AIRCASTLE MODEL 5044

TRADE NAME	Aircastle, Model 5044
SUPPLIER	Spiegel Inc., 1061 W. 35th St., Chicago, Illinois
TYPE SET	AC Operated Phono Player And Superheterodyne Receiver With Loop Antenna
TUBES (FOUR)	Types 12SA7 Converter, 12SQ7 Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	105-125 Volts AC-DC RATING .23 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, set tuning cap fully closed and set pointer to last reference mark at low frequency end of dial. Use isolation transformer if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator on rear section of tuning gang. Low side to B-.	455KC (400 ∿ Mod.)	Tuning gang fully open	Across voice coil.	A1, A2,	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	.1MFD	"	1620KC	"	"	A3	Adjust for maximum output
3.	200MMFD	High side to antenna terminal. (Remove hank ant.) Low side to B-.	1400KC	Tune for max. output.	"	A4	Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

AIRCASTLE
MODEL 5044

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRCASTLE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12SA7	12SA7	8R	
V2	Det.-AVC-AF	12SQ7	12SQ7	8Q	
V3	Power Output	50L6GT	50L6GT	7AC	
V4	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRCASTLE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	150	EC-12	PRS150/40-20		EDL4215		TVA-2438	Filter Red
B	20	150							Filter Yellow
C2	240	500		1468-00025	D6-251	5W5T25	GP2K-250	1FM-325	RF Coupling *
C3	51		MC-4	S150	D6-500	5W5Q5	GP1K-50	19C28	Osc. Grid Cap
C4	.25	200	PC-4	P488-25		GT2P25		2TM-P25	Bias Filter
C5	.05	400	PC-2	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C6	100	500	MC-2	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C7	470	500	MC-8	1468-0005	D6-471	5W5T5	GP2K-470	1FM-35	Tone Comp.
C8	.05	400	PC-5	P488-05	DF-503	PTE4S5		4TM-S5	Phono Isolation
C9	.005	600	PC-10	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling
C10	470	500	MC-8	1468-0005	D6-471	5W5T5	GP2K-470	1FM-35	AF Amp. Plate
C11	.005	600	PC-10	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling
C12	.01	400	PC-7	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Output Plate Bypass
C13	.1	400	PC-8	P488-1	DF-104	PTE4P1		72P52	Line Isolation
C14	.05	400	PC-5	P488-05	DF-503	PTE4S5		4TM-S5	Line Filter

* Not Used In All Models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1Meg	½	VC-4	Q13-137	AG-63-Z	BSK-70-S	Volume control
B	Shaft		Not req.	Not req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not req.	Not req.	SWB	Not req.	Attach to R1A per instructions

RESISTORS

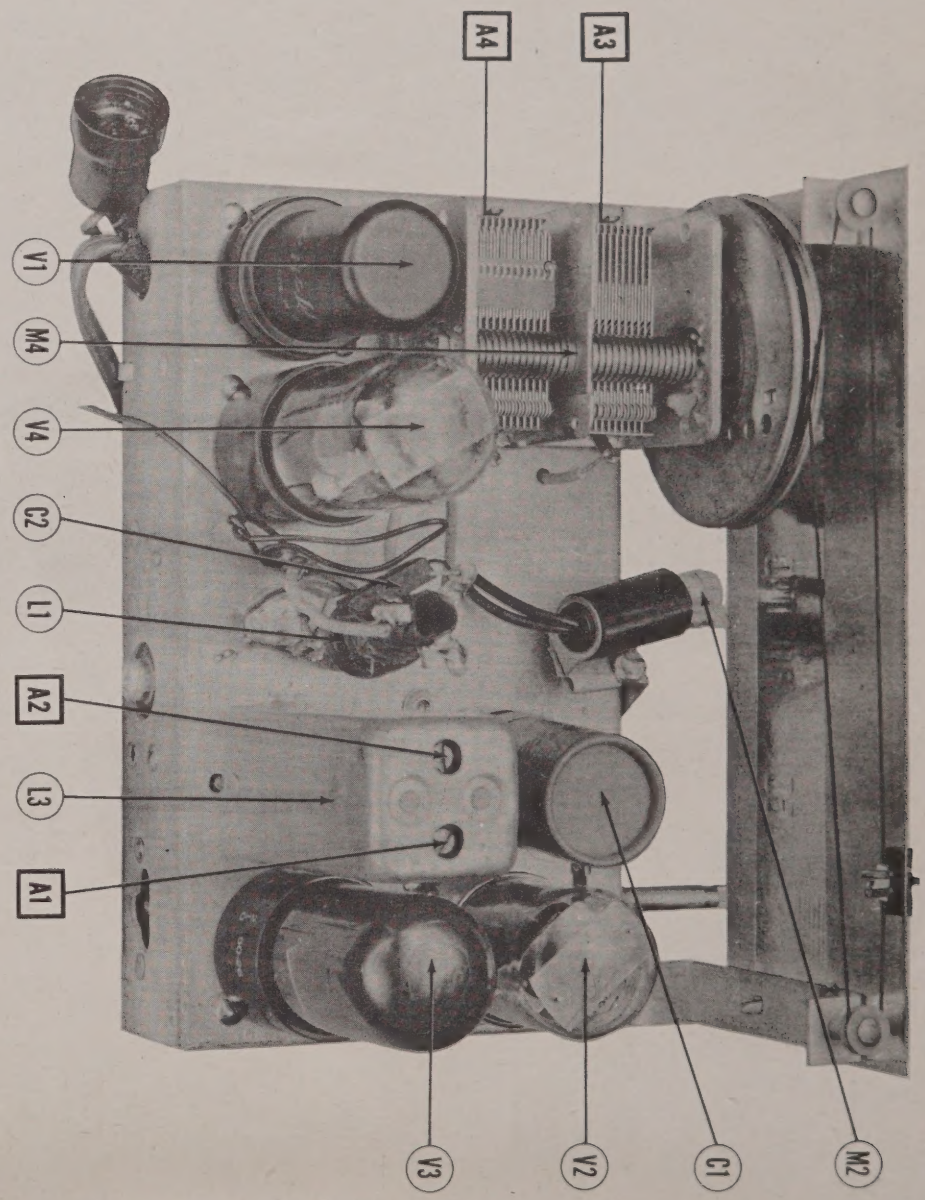
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	IDENTIFICATION CODES
R2	22KΩ	½	IR-9		Osc. Grid
R3	47KΩ	½	IR-10	BTS-47K	Bias Net
R4	3.3Meg	½	IR-23	BTS-3.3Meg	AVC Network
R5	10Meg	½	IR-3	BTS-10Meg	AF Amp. Grid
R6	680KΩ	½		BTS-680K	Tone Compensation See Note
R7	470KΩ	½	IR-11	BTS-470K	AF Amp. Plate
R8	560KΩ	½		BTS-560K	Output Grid - See Note
R9	2200Ω	1	IR-25	BTA-2200	Filter
R10	33Ω	½	IR-17		Surge Limiter
R11	47Ω	1	IR-41	BW-1-47	Filament String
R12	220K	½	IR-20	BTS-220K	Isolation
R13	220K	½	IR-20	BTS-220K	Isolation

Note Some Models Use 470KΩ Resistor In This Application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	1800Ω	3.4Ω	150Ω	.5Ω	SPK-10	A 3332 ①	A3025 ①	RO-2 ①	① Bend mounting tabs down, file out slot and mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			AIRCASTLE PART No.	VIKING PART No.	QUAM PART No.	
	FIELD	V. C. IMP.				
SP1	PM	3.4Ω	SPK-10	4J4	4AO7	
	CONE DIA.	V. C. DIA.				
SP2	4"	1/2"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	AIRCASTLE PART No.	MEISSNER PART No.	
L1	Ant. Coil	23Ω	2.8Ω	LA-3	14-1056	
L2	Osc. Coil	.8Ω	1.5Ω	LO-14	14-1073	
L3	IF	16Ω	16Ω	LI-8	16-6660	

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA					REMARKS
	AIRCASTLE PART No.	ASTATIC PART No.		SHURE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		LT-4-AG 510-LT-4AG †	D-AG	W66B 92U †	A66U	† Complete arm assembly

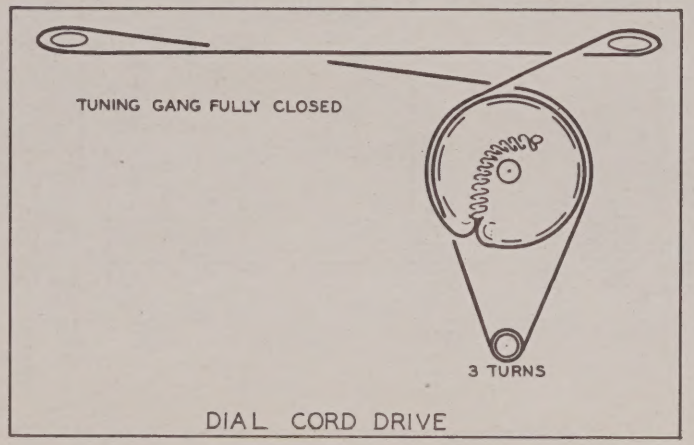
ASTATIC AND SHURE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					AIRCASTLE PART No.		
M2	Bayonet	6-8	.15	Brown	PB-1		Type Number 47

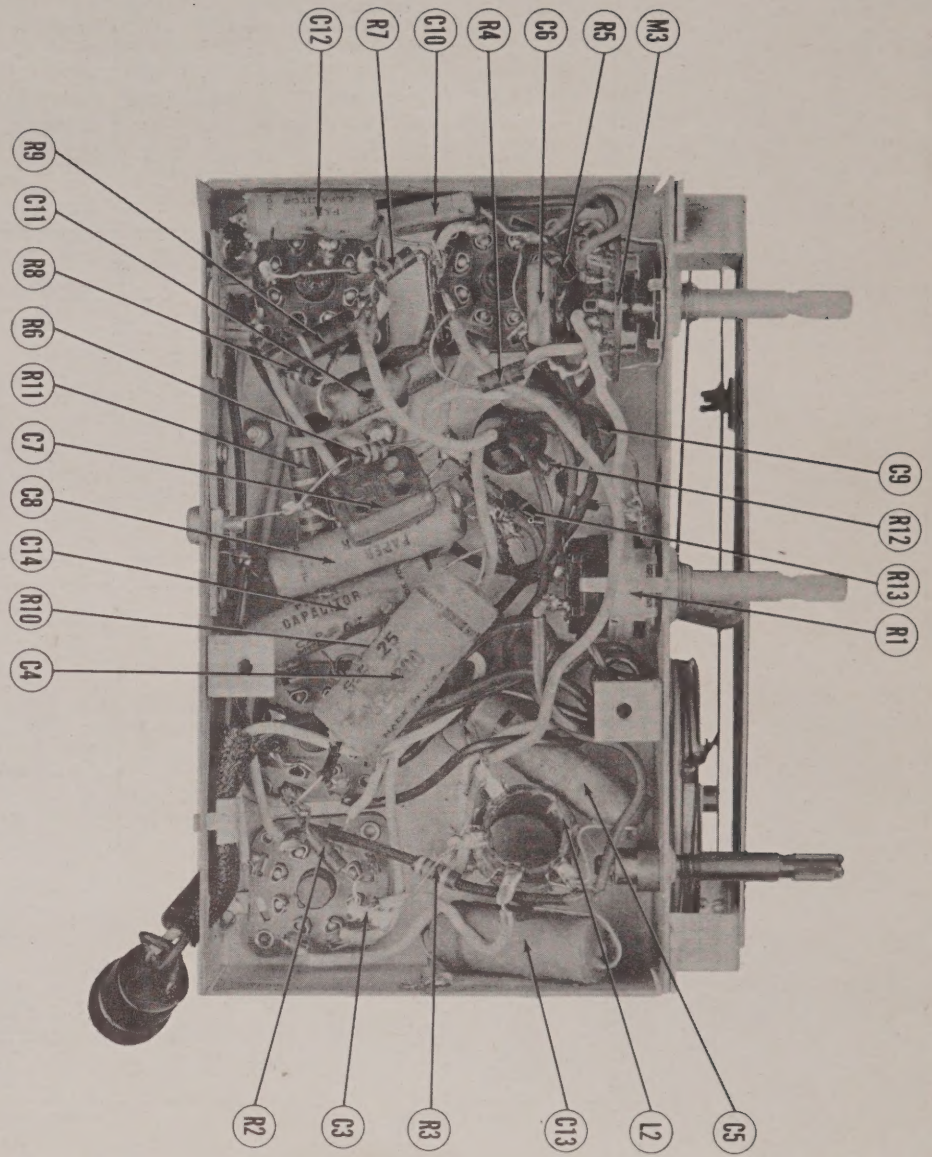
MISCELLANEOUS

ITEM No.	PART NAME	AIRCASTLE PART No.	NOTES
M3	Switch	SW-1	Radio-Phono
M4	2 gang var. cap.	GC-6A	(15-447MMF, 13-192MMF)



DIAL CORD DRIVE

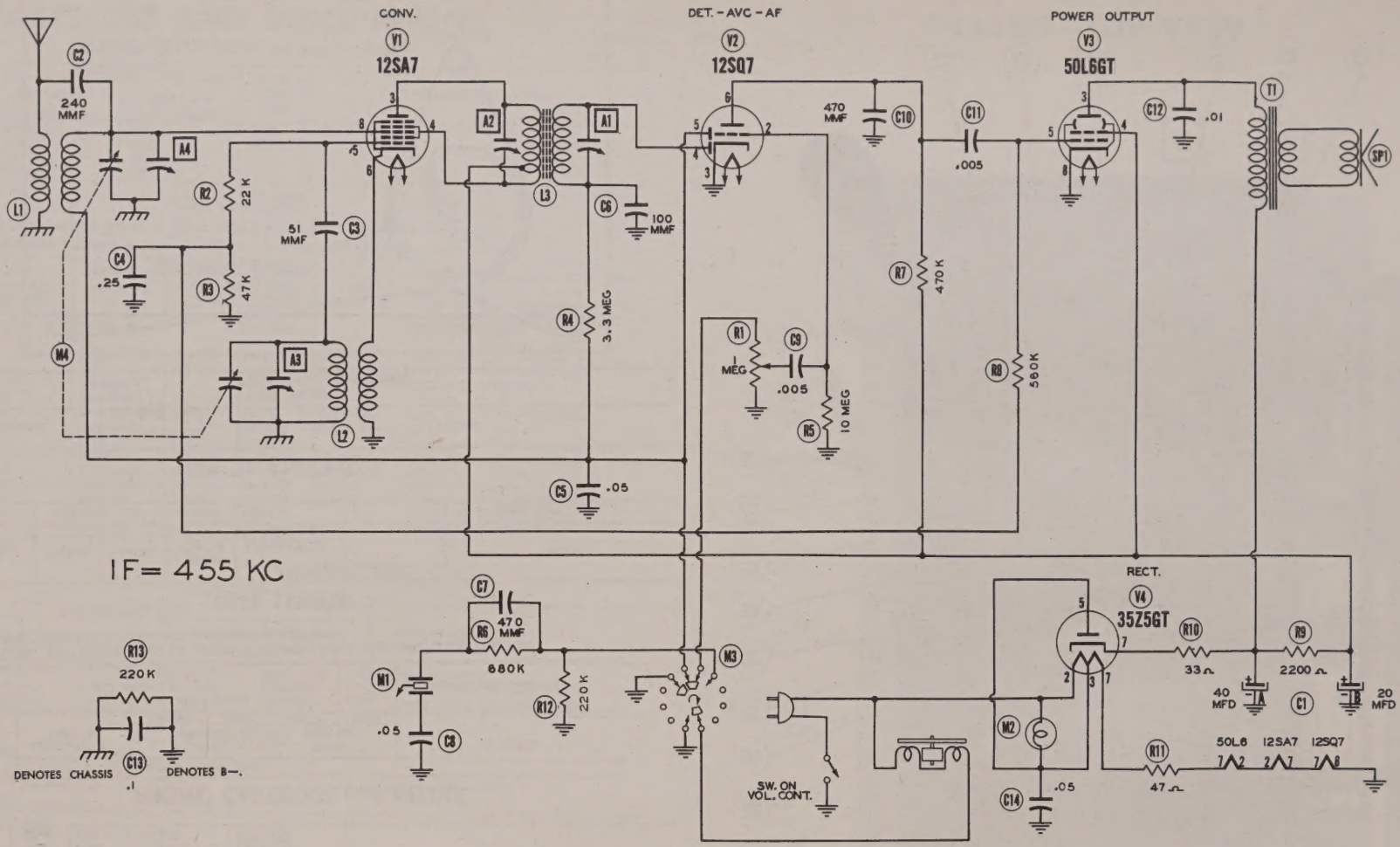
CHASSIS—BOTTOM VIEW



SET 121 FOLDER 2

AIRCASTLE MODEL 5044

AIRCASTLE MODEL 5044



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	0V	25VAC	85VDC	85VDC	§-7.3VDC	0V	13VAC	-.6VDC
V 2	12SQ7GT	0V	-.6VDC	0V	-.6VDC	-.6VDC	50VDC	13VAC	0V
V 3	50L6GT	0V	25VAC	100VDC	85VDC	-1.4VDC	-5.3VDC	75VAC	0V
V 4	35Z5GT	0V	117VAC	110VAC	-5.3VDC	110VAC	Inf.	85VAC	110VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	220KΩ	25Ω	†2.2KΩ	†2.2KΩ	70KΩ	.8Ω	13Ω	4.3 Meg.
V 2	12SQ7GT	220KΩ	10 Meg.	0Ω	1 Meg.	4.3 Meg.	†470KΩ	13Ω	0Ω
V 3	50L6GT	220KΩ	25Ω	†180Ω	†2.2KΩ	600KΩ	47KΩ	75Ω	0Ω
V 4	35Z5GT	220KΩ	150Ω	140Ω	47KΩ	140Ω	Inf.	125Ω	35KΩ

RADIO-PHONO SWITCH IN RADIO POSITION

† MEASURED FROM PIN 8 OF V4

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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121-2

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

AIR KING MODELS

16C1, 16C2, 16C3, 16M1, 16T1, 19C1, 718R

IMPORTANT FILING NOTICE

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Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MODEL 16C1

AIR KING MODELS
16C1, 16C2, 16C3, 16M1, 16T1, 19C1, 718R

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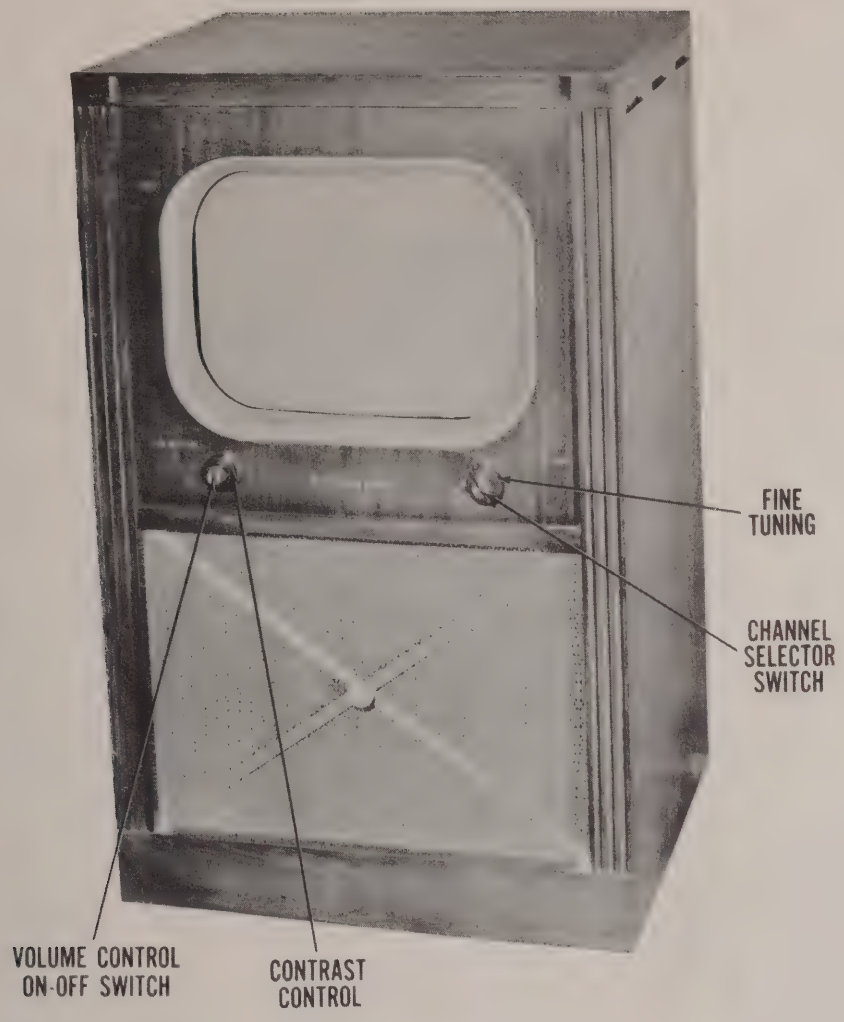
Date 1/51 Set No. 121—Folder No. 3



AIR KING MODELS 16C1, 16C2, 16C3, 16M1, 16T1, 19C1, 718R

AIR KING MODEL 16C1

TRADE NAME	Air King Models 16C1, 16C2, 16C3, 16M1, 16T1, 19C1, 718R
MANUFACTURER	Air King Products Co., 170 53rd St., Brooklyn, New York
TYPE SET	Television Receiver
TUBES	Nineteen
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	1.95 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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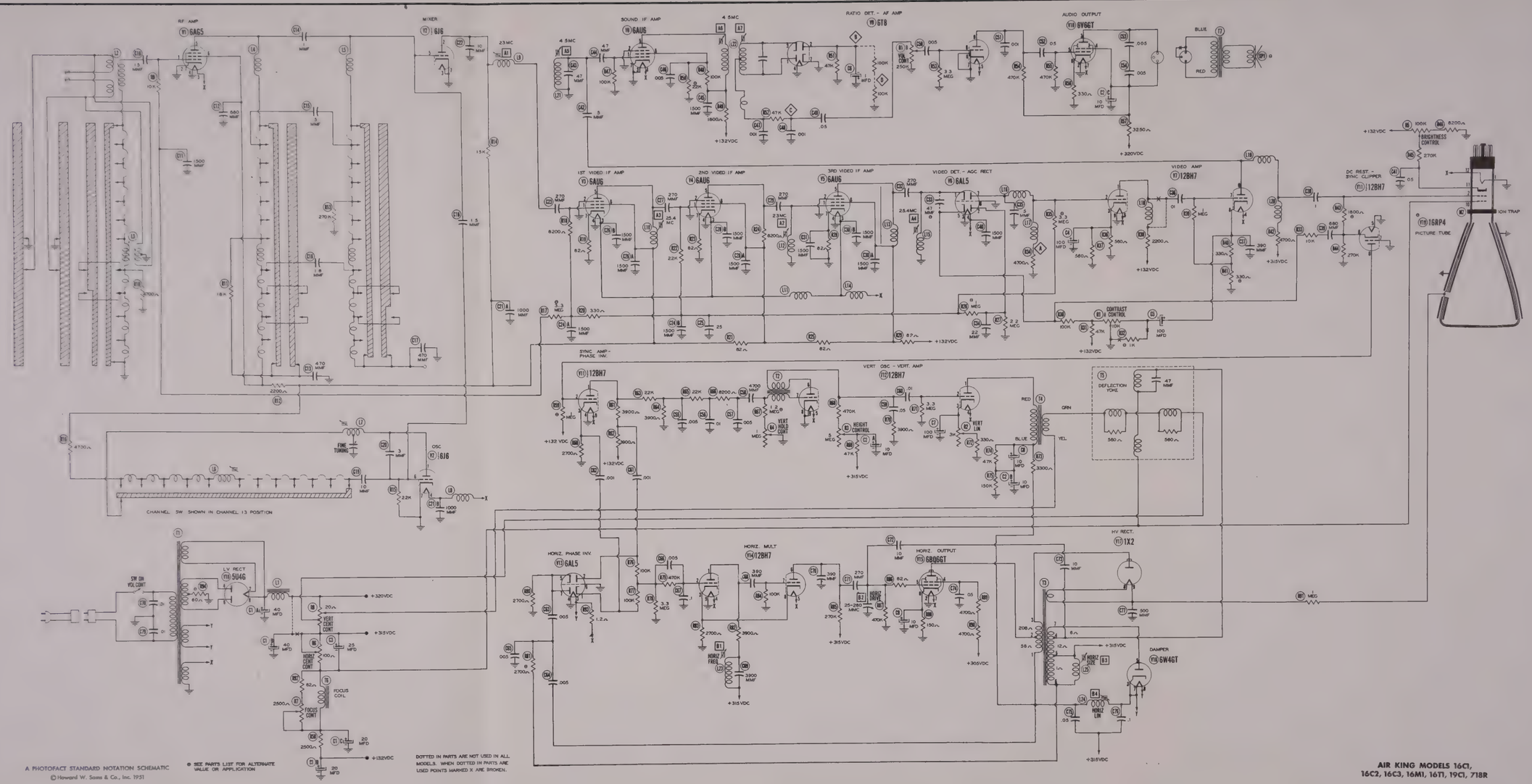

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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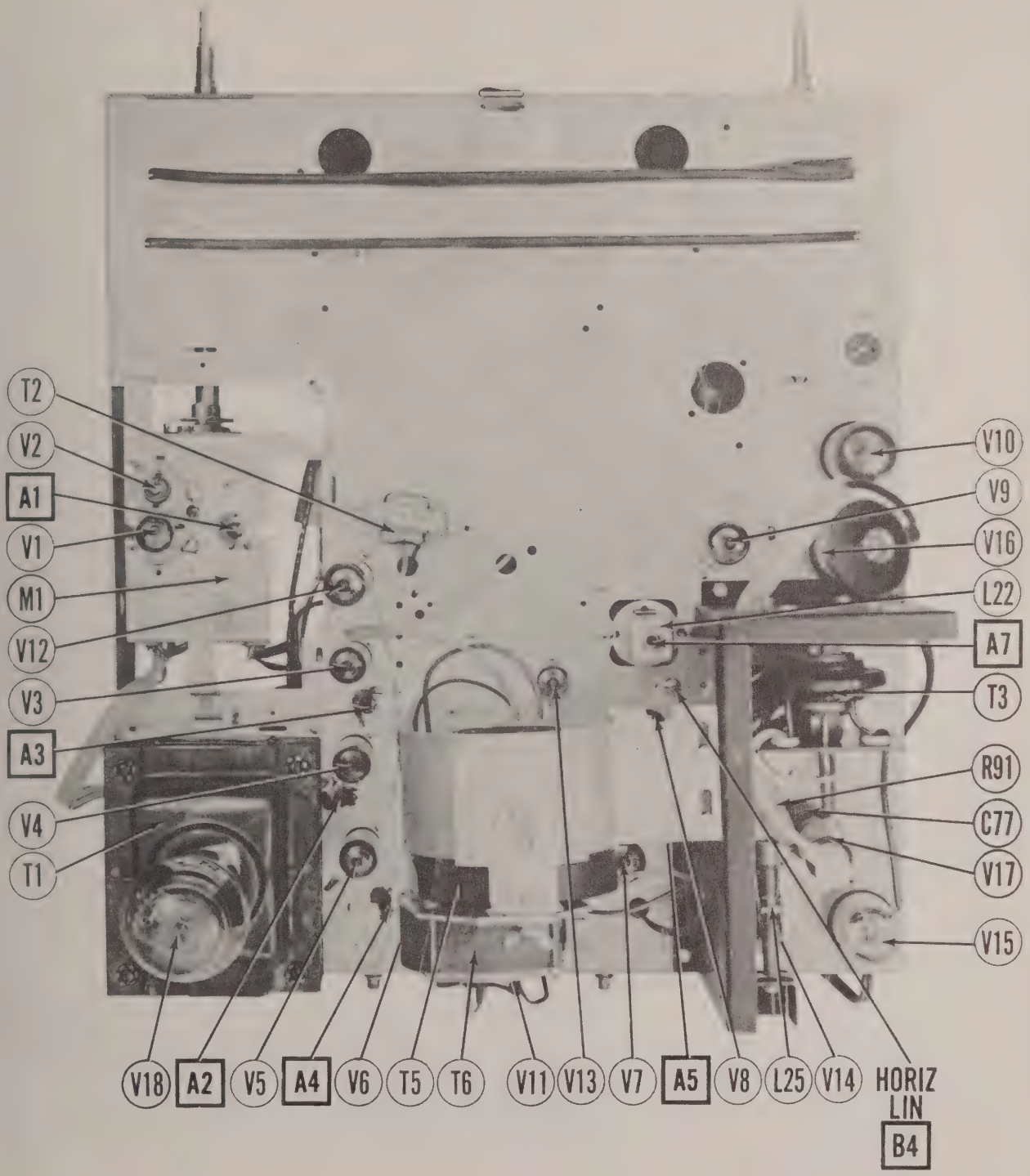
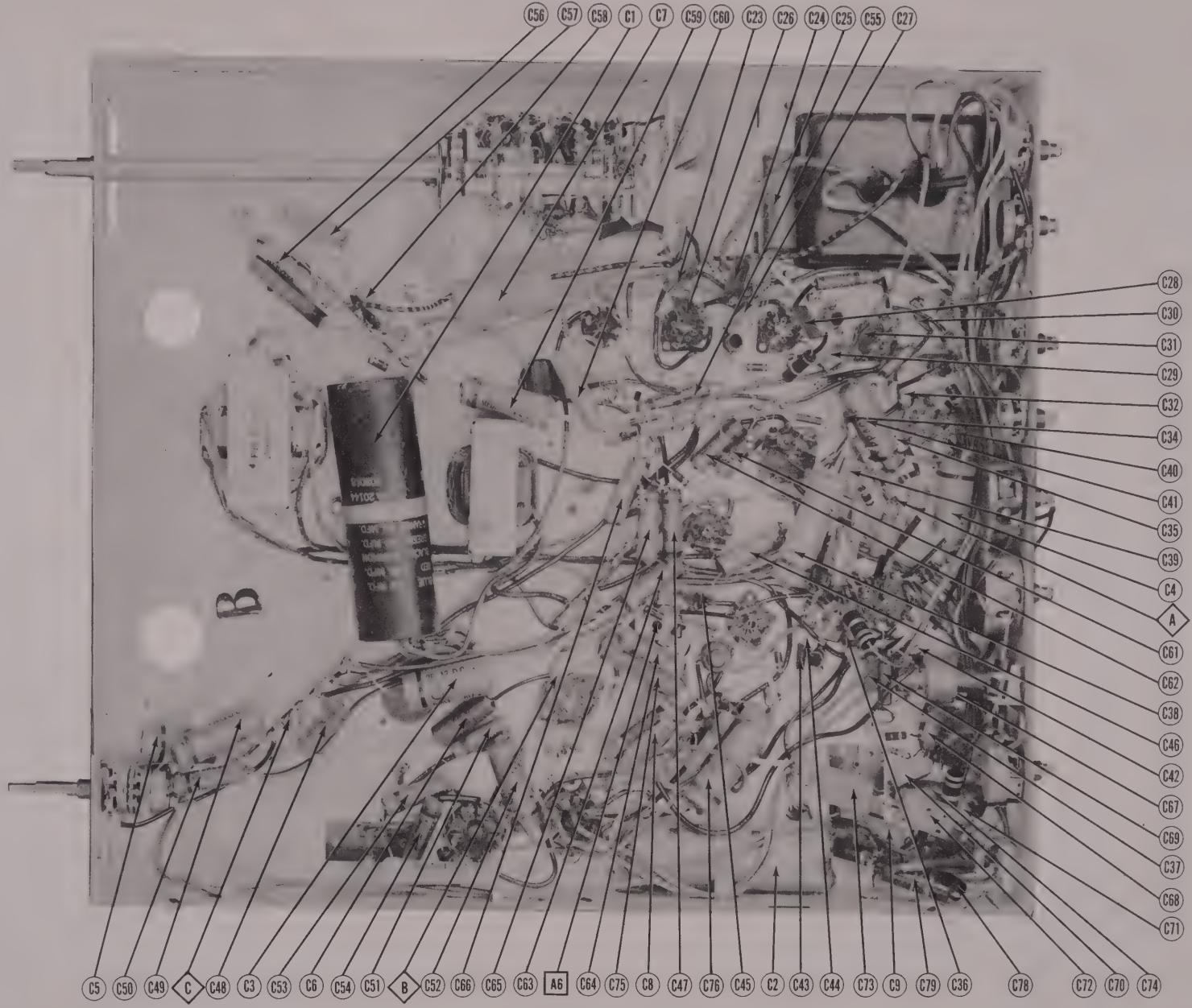
AIR KING MODELS 16C1, 16C2, 16C3, 16M1, 16T1, 19C1, 718R

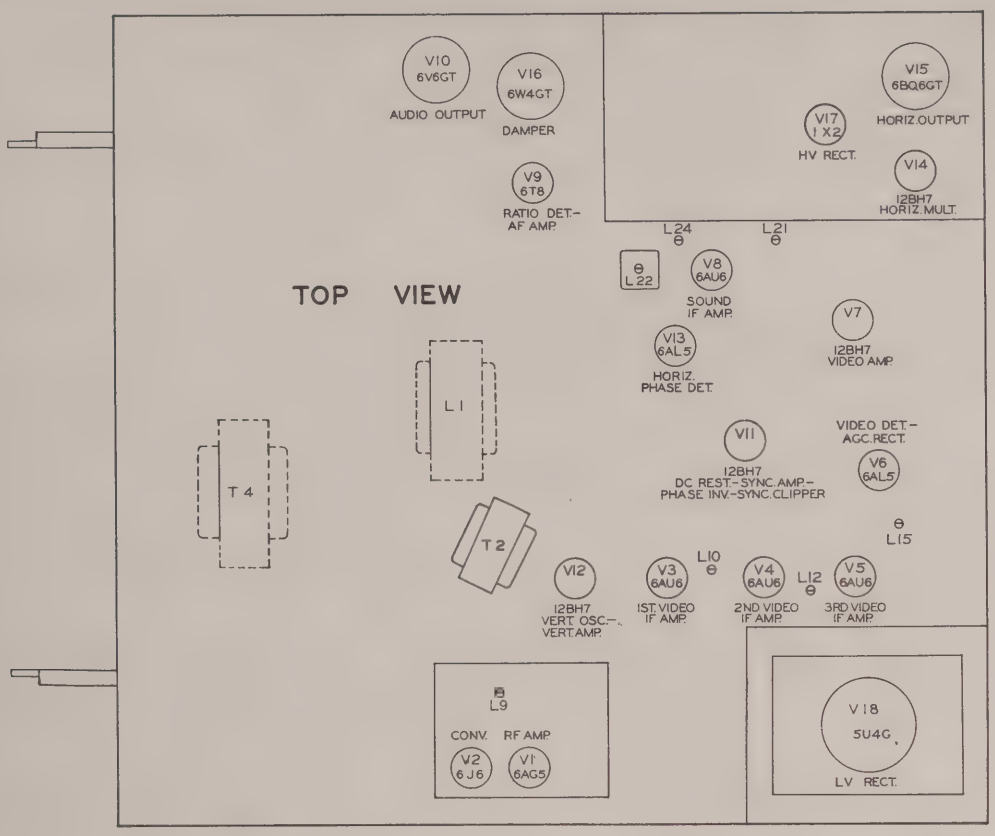
AIR KING MODELS 16C1, 16C2, 16C3, 16M1, 16T1, 19C1, 718R

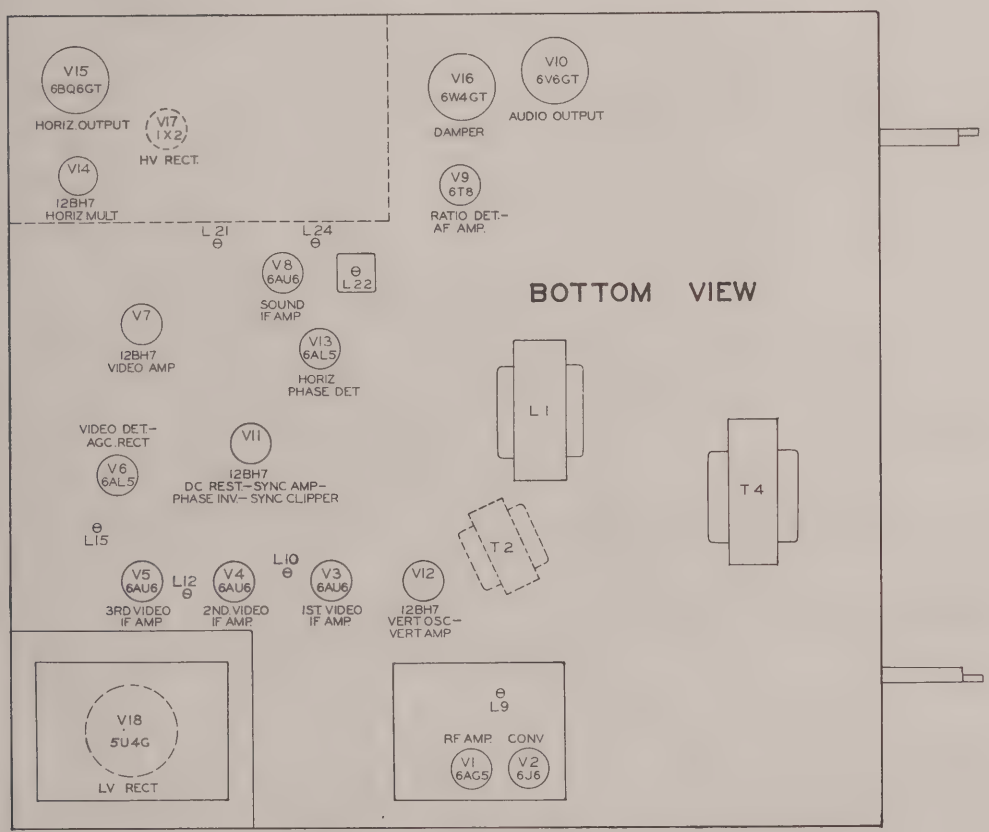


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator (V14) from its socket.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) and replace it with a 6J6 which has pin 1 removed. This will disable the local oscillator and prevent the possibility of erroneous indications.

Connect the negative lead of a 3 volt battery to the junction of R20 and C25, connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	23MC (Unmod.)	Any	DC Probe to Point (A). Common to chassis.	A1, A2	Adjust for maximum deflection.
2.	Direct	"	25.4MC	"	"	A3, A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	23MC (10MC SWP)	21.9MC 26.4MC	Any	Vert. Amp. to Point (A). Low side to chassis.		Check for response curve similar to figure 1. If necessary retouch A1 thru A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (± 1%) resistors in series from Point B to chassis. The junction of these two resistors is alignment Point D as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 7 (Grid) of 12BH7 (V7). Low side to chassis.	4.5MC (Unmod.)	Any	DC Probe to Point (B). Common to chassis.	A5, A6	Adjust for maximum deflection.
5.	.01MFD	"	"	"	DC Probe to Point (C). Common to Point (D).	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 7 (Grid) of 12BH7 (V7). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. Amp. to Point (B). Low side to chassis.	A5, A6	Disconnect stabilizer capacitor C6. Adjust for maximum amplitude and symmetry as per figure 2.
5.	.01MFD	"	"	"	"	Vert. Amp. to Point (C). Low side to chassis.	A7	Reconnect capacitor C6. Adjust A7 so 4.5MC occurs at center of crossover lines as per figure 3. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter and replace the original 6J6 in its socket.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 213.75MC	13	Vert. Amp. to Point (A). Low side to chassis.	A8	Adjust to place sound marker as shown in figure 4. The video marker should be at 50%.
7.	"	"	207MC (10MC SWP)	205.25MC 209.75MC	12	"		Check all high band channels to see that the sound marker can be properly placed well within the range of the fine tuning control. If not, compromise adjustment of A8 may be required.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
8.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A9	Adjust to place sound marker as shown in figure 4. The video marker should be at 50%.
9.	"	"	79MC (10MC SWP)	77.25MC 81.75MC	5	"		Check all low band channels to see that the sound marker can be properly placed well within the range of the fine tuning control. If not, compromise adjustment of A9 may be required.
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

THE RF AND MIXER PORTION OF THIS RECEIVER HAS BEEN PROPERLY ALIGNED AT THE FACTORY AND IS VERY STABLE. ALIGNMENT OF THIS PORTION SHOULD BE REQUIRED IN THE FIELD.

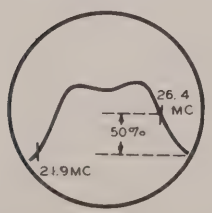


FIG. 1

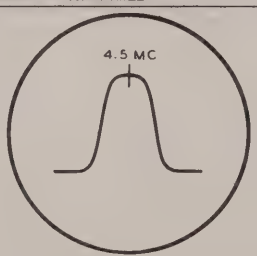


FIG. 2

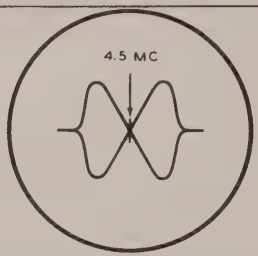


FIG. 3

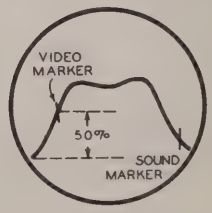
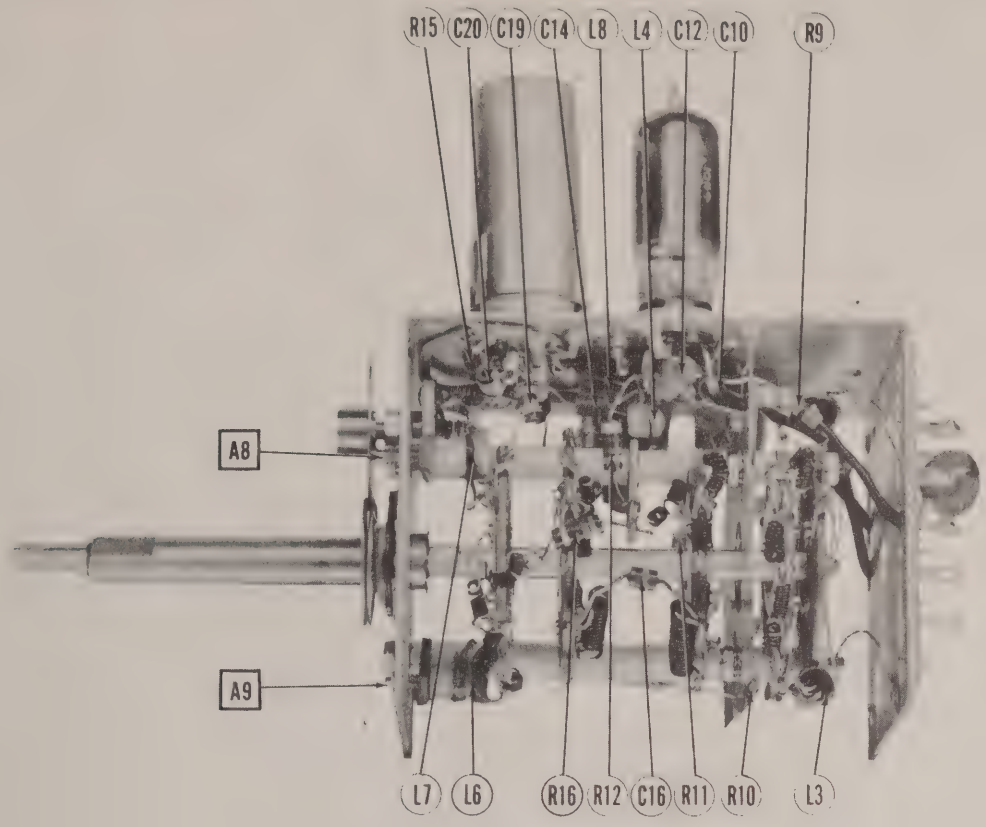
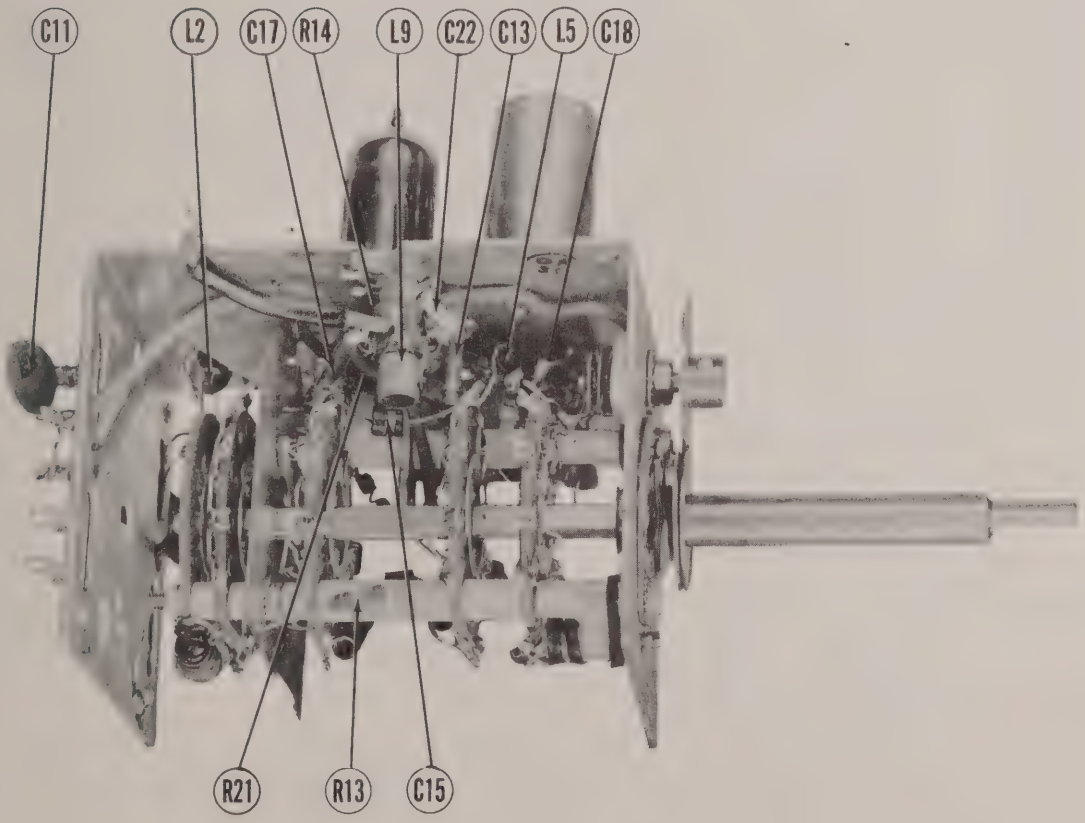


FIG. 4



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.6VDC	0V	6.3VAC	0V	110VDC	110VDC	0V		
V 2	6J6	90VDC	70VDC	0V	6.3VAC	-1.4VDC	§-5VDC	0V		
V 3	6AU6	-.2VDC	0V	6.3VAC	0V	115VDC	130VDC	.6VDC		
V 4	6AU6	-.2VDC	0V	6.3VAC	0V	65VDC	130VDC	.6VDC		
V 5	6AU6	0V	0V	6.3VAC	0V	120VDC	130VDC	1VDC		
V 6	6AL5	0V	-1.6VDC	0V	6.3VAC	.1VDC	0V	-.3VDC		
V 7	12BH7	115VDC	-.3VDC	2.8VDC	6.3VAC	6.3VAC	230VDC	1VDC	14VDC	0V
V 8	6AU6	-1VDC	0V	0V	6.3VAC	130VDC	40VDC	0V		
V 9	6T8	-.4VDC	-1.2VDC	-.4VDC	0V	6.3VAC	0V	0V	-1.2VDC	55VDC
V 10	6V6GT	0V	0V	205VDC	215VDC	0V	320VDC	6.3VAC	11VDC	
V 11	12BH7	65VDC	25VDC	25VDC	0V	0V	25VDC	0V	3.6VDC	6.3VAC
V 12	12BH7	420VDC	0V	35VDC 8VDC	6.3VAC	6.3VAC	175VDC 25VDC	-35VDC -40VDC	0V	0V
V 13	6AL5	7.4VDC	-7.4VDC	5.6VAC	0V	0V	0V	0V		
V 14	12BH7	300VDC	.3VDC	18VDC	6.3VAC	6.3VAC	90VDC	-3.2VDC	18VDC	0V
V 15	6BQ6GT	0V	0V	0V	170VDC	.3VDC	0V	6.3VAC	17VDC	TOP CAP *
V 16	6W4GT	370VDC	320VDC	480VDC	0V	330VDC	0V	480VDC	480VDC	
V 17	1X2	* DO NOT MEASURE								
V 18	5U4G	0V	325VDC	0V	320VAC	0V	320VAC	0V	325VDC	
V 19	16RP4	0V	3.7VDC	PIN 10 320VDC	PIN 125VDC	11 4VDC	PIN 12 6.3VAC			

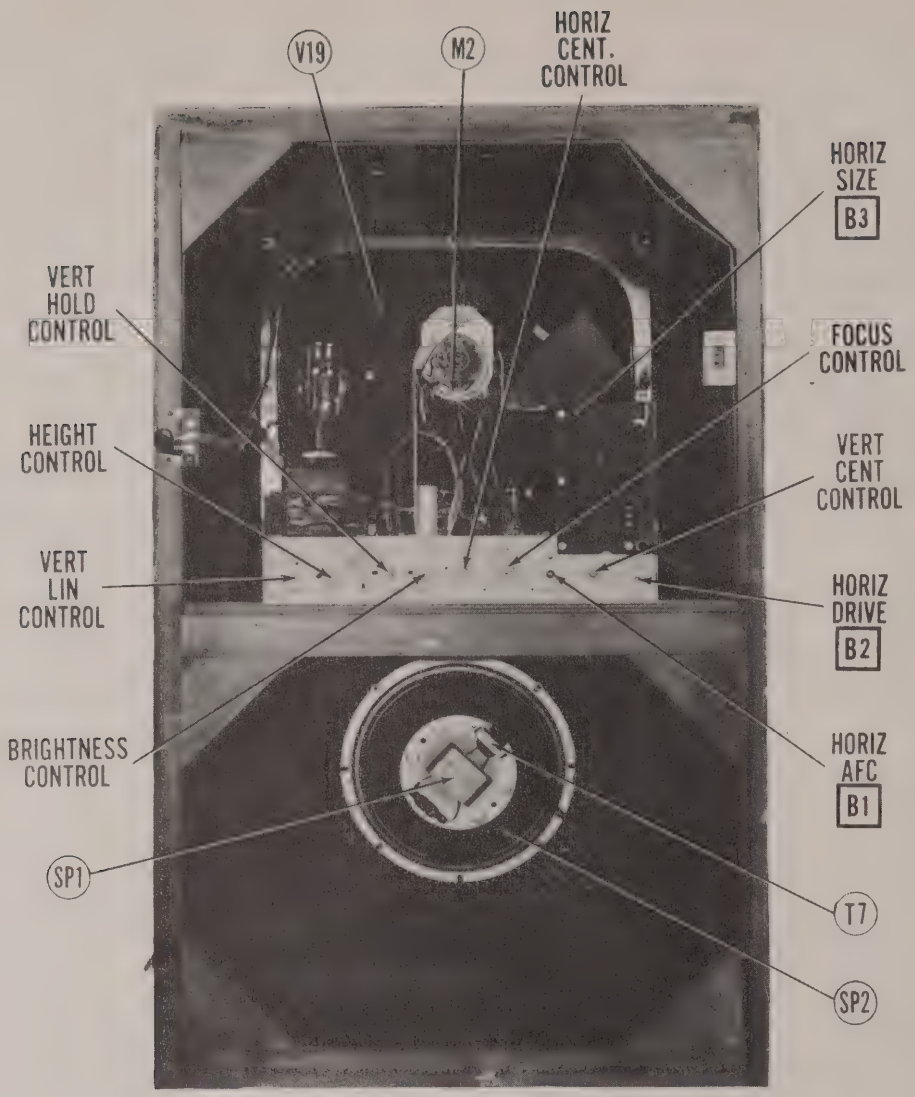
FOCUS CONTROL COUNTERCLOCKWISE
§ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT MEASURE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	4 Meg.	0Ω	.1Ω	0Ω	†5.2KΩ	†5.2KΩ	0Ω		
V 2	6J6	†7.7KΩ	†18KΩ	0Ω	.3Ω	270KΩ	22KΩ	0Ω		
V 3	6AU6	1.6 Meg.	0Ω	.1Ω	0Ω	†3KΩ	†3KΩ	82Ω		
V 4	6AU6	1.6 Meg.	0Ω	.5Ω	0Ω	†11KΩ	†3KΩ	82Ω		
V 5	6AU6	.3Ω	0Ω	.3Ω	0Ω	†3KΩ	†3KΩ	82Ω		
V 6	6AL5	.3Ω	1.5 Meg.	0Ω	.1Ω	100KΩ	0Ω	4.7KΩ		
V 7	12BH7	†5KΩ	4.7KΩ	250Ω	.1Ω	.1Ω	†4.7KΩ	1 Meg.	660Ω	0Ω
V 8	6AU6	100KΩ	0Ω	0Ω	.1Ω	†4.8KΩ	†100KΩ	0Ω		
V 9	6T8	Inf.	47KΩ	Inf.	0Ω	.1Ω	0Ω	0Ω	3.3 Meg.	†470KΩ
V 10	6V6GT	Inf.	0Ω	†3.6KΩ	†3.2KΩ	470KΩ	†0Ω	.1Ω	330Ω	
V 11	12BH7	†10KΩ	†1 Meg.	2.7KΩ	0Ω	0Ω	†1 Meg.	0Ω	270KΩ	.1Ω
V 12	12BH7	#4KΩ	3.3 Meg.	330Ω 3.3KΩ	.1Ω	.1Ω	†520KΩ †5 Meg.	1.6 Meg. 2.6Meg.	0Ω	0Ω
V 13	6AL5	3.4 Meg.	3.4 Meg.	.8Ω	0Ω	2.7KΩ	0Ω	2.7KΩ		
V 14	12BH7	†4KΩ	3.8 Meg.	2.7KΩ	.1Ω	.1Ω	†270KΩ	100KΩ	2.7KΩ	0Ω
V 15	6BQ6GT	Inf.	0Ω	Inf.	†10KΩ	470KΩ	Inf.	.1Ω	150Ω	TOP CAP #90Ω
V 16	6W4GT	#50KΩ	†47KΩ	160KΩ	Inf.	†30Ω	Inf.	#0Ω	#.1Ω	
V 17	1X2	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #295Ω
V 18	5U4G	Inf.	20KΩ	Inf.	85Ω	Inf.	85Ω	Inf.	20KΩ	
V 19	16RP4	0Ω	270KΩ	PIN 10 †25Ω	PIN 300KΩ	11 330KΩ	PIN 12 .1Ω			

FOCUS CONTROL COUNTERCLOCKWISE
† MEASURED FROM 320VDC POINT
# MEASURED FROM PIN 3 OF V16

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



CABINET–REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal oscillator slug (B2) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) clockwise as far as possible without crowding the right half of the picture.

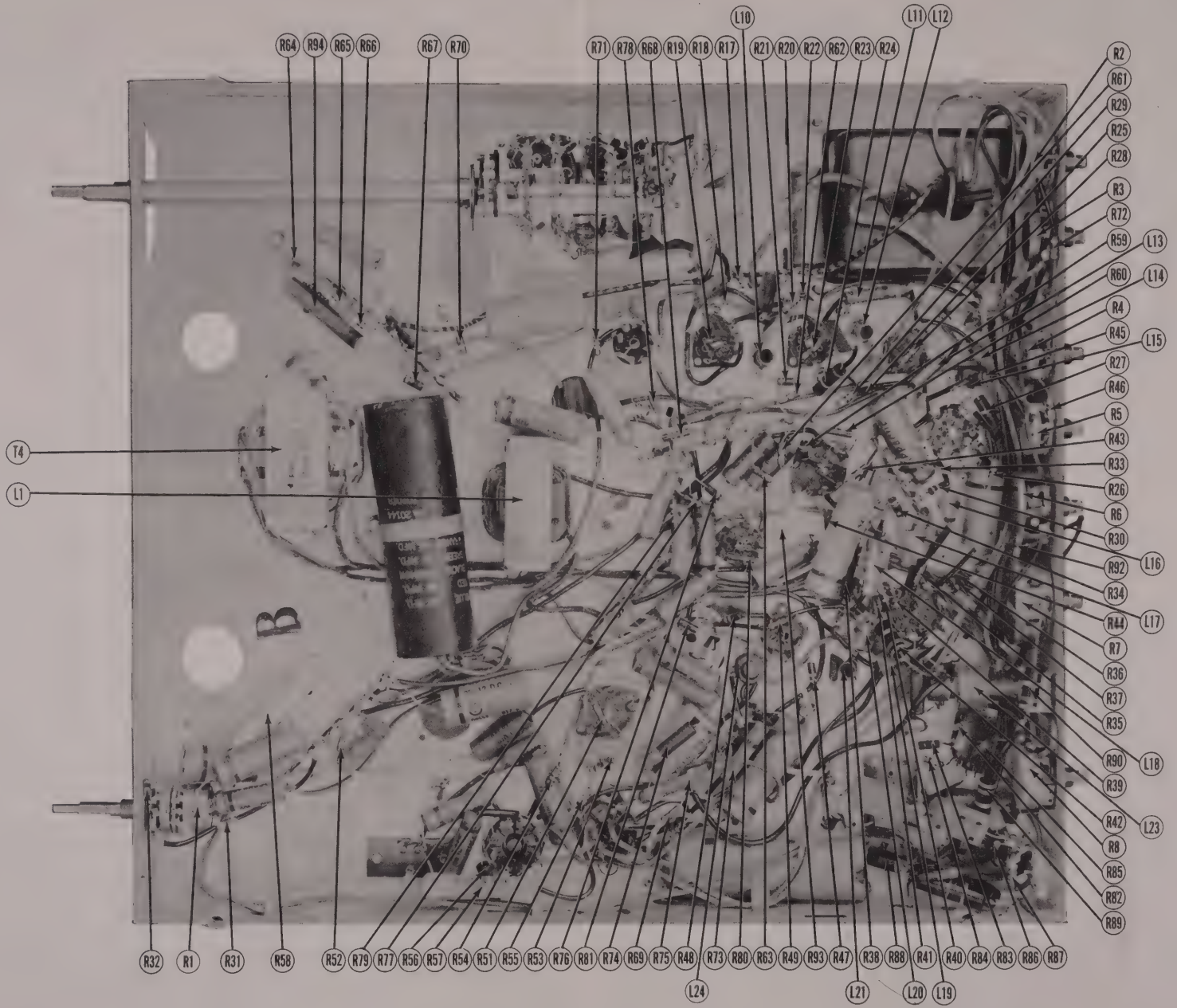
Adjust the horizontal size slug (B3) until the picture fills the mask horizontally.

Adjust the horizontal linearity slug (B4) until the picture is symmetrical from left to right. Slight readjustment of B2 may be necessary for optimum results.

DISASSEMBLY INSTRUCTIONS

1. Remove four push-on type control knobs.
2. Remove nine wood screws holding rear cover in place. Remove rear cover.
3. Remove interlock switching arrangement.
4. Disconnect built-in antenna.
5. Remove antenna terminal strip.
6. Disconnect speaker at chassis.
7. Remove four 9/32" hex head bolts from chassis. Remove chassis.
8. Remove four 11/32" hex nuts from speaker. Remove speaker.

NOTE: FOR PICTURE TUBE REMOVAL, IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIR KING PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6AG5	6AG5	7BK	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF	6AU6	6AU6	7BK	
V4	2nd Video IF	6AU6	6AU6	7BK	
V5	3rd Video IF	6AU6	6AU6	7BK	
V6	Video Det.-AGC Rect.	6AL5	6AL5	6BT	
V7	Video Amp	12BH7	12BH7	9A	
V8	Sound IF Amp	6AU6	6AU6	7BK	
V9	Ratio Det.-AF Amp.	6T8	6T8	9E	
V10	Audio Output	6V6GT	6V6GT	7AC	
V11	DC Rest.-Sync. Clipper-Sync. Amp.-Phase Inv.	12BH7	12BH7	9A	
V12	Vert. Osc.-Vert. Amp	12BH7	12BH7	9A	
V13	Hor. Phase Det.	6AL5	6AL5	6BT	
V14	Hor. Mult	12BH7	12BH7	9A	
V15	Hor. Output	6BQ6GT	6BQ6GT	6AM	
V16	Damper	6W4GT	6W4GT	4CG	
V17	HV Rect.	1X2	1X2	TCB	
V18	LV Rect.	5U4G	5U4G	5T	
V19A	Picture Tube	16RP4	16RP4	12D	
B	Picture Tube	19BP4	19BP4	12D	Used in model 19C1

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIR KING PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	A20144	E59C21		UP4445		TVL-3787	Filter-Red
B	40	450				UP2245		TVA-1709	Filter-Blue
C	20	450							Filter-Green
D	20	450							Filter-Orange
C2A	10	450	A20135	E59C18		UP11145		TVL-3776	Vert. Osc. Dec.-Red Vert. Output Dec.-Yel. Decoupling-Blue
B	10	450							Hor. Cent. Cont. Byp.
C	10	450							
C3	25	12	A20147	PRS250/20		BR252A		TVA-1205	V. Amp. Cath.
C4	100	12	A20141	PRS25/100		BRH121A		TVA-1130	V. Amp. Cath.
C5	100	12	A20141	PRS25/100		BRH121A		TVA-1130	Stabilizing Cap.
C6	1	50	A20138	PRS150/4		BR145		TVA-1300	Vert. Output Cath.
C7	100	25	A20130	PRS50/100		BRH251A		TVA-1207	Vert. Output Dec.
C8	10	250	A20145	PRS350/12		BR1025		TVA-1504	Hor. Output Cath.
C9	10	25	A20137	PRS25/10		BR102A		TVA-1204	RF Coupling
C10	25			SI15	D6-150		GP1K-15	19C22	Hor. Cent. Cont. Byp.
C11	1500			BPD-0015	DD-152		801-0015	29C8	AGC Filter
C12	680			SI680	D6-681		GP2K-680	19C17	RF Amp. Dec.
C13	470			SI470	D6-471		GP2K-470	19C15	RF Amp. Dec.
C14	1				TCZ-1				RF Coupling
C15	.5				TCZ-.5				RF Coupling
C16	1.8								RF Coupling
C17	470			SI470	D6-471		GP2K-470	19C15	Conv. Grid Filter
C18	1.5			SI1.5NPO	TCZ-1.5		NPOK-1.5		Osc. Coupling
C19	10			SI10NPO	TCZ-10		NPOK-10	19C3	Osc. Grid Cap.
C20	3			SI3NPO	TCZ-3.3		NPOK-3		Osc. Feedback
C21A	1000			BPD-2 x 001	DD-2-102		812-2 x 001	29C7	RF Bypass
B	1000								Conv. Fil. Bypass
C22	10			SI10NPO	TCZ-10		NPOK-10	19C3	Fixed Trimmer
C23	270	500		1468-00025	D6-271		GP2K-270	1FM-325	IF Coupling
C24A	1500		A19147			1W5D15			AGC Filter
B	1500			BPD-2 x 0015	DD-2-152	1W5D15	812-2 x 0015	29C6	AGC Filter
C	.25	200	A194-67	P488-25		GT2P25		2TM-P25	AGC Filter
C26A	1500		A19147			1W5D15			1st V. IF Dec.
B	1500			BPD-2 x 0015	DD-2-152	1W5D15	812-2 x 0015	29C6	1st V. IF Fil.
C27	270	500	A190-133	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C28A	1500		A19147			1W5D15			2nd V. IF Dec.
B	1500			BPD-2 x 0015	DD-2-152	1W5D15	812-2 x 0015	29C6	2nd V. IF Fil.
C29	270	500	A190-133	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C30A	1500		A19147			1W5D15			3rd V. IF Dec.
B	1500			BPD-2 x 0015	DD-2-152	1W5D15	812-2 x 0015	29C6	3rd V. IF Fil.
C31	1500		A19148	BPD-0015	DD-152	1W5D15	801-0015	29C8	3rd V. IF Cath.
C32	270	500	A190-133	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C33	47		A555-113-2	SI47	D6-470	5W5Q5	GP1K-47	19C25	IF Coupling *
C34	22	500	A555-106	SI22	D6-220	5W5Q25	GP1K-22	19C23	AGC Filter
C35	5		A555-100	SI5	TCZ-4.7	5W5V5	GP1K-5	MS-55	V. Diode Filter
C36	.01	600	A194-155	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Video Coupling
C37	390	500	A190-137	1468-0004	D6-391	5W5T4	GP2K-390	1FM-34	V. Amp. Cath.
C38	.1	600	A194-162	P688-1		DF-104	PTE4P1	6TM-P1	Video Coupling
C39	680	500	A190-143	SI680	D6-681	1W5T7	GP2K-680	1FM-37	Video Coupling
C40	1500		A19148	BPD-0015	DD-152	1W5D15	801-0015	29C8	V. Det. AGC Fil.
C41	.05	600	A194-160	P688-05	DF-503	PTE6S5		6TM-S5	Pic. Tube Cath.
C42	5		A555-100	SI5	TCZ-4.7	5W5V5	GP1K-5	MS-55	S. IF Coupling
C43	47	500		1469-00005	TCZ-47	5R5Q5	NPOM-50	MS-45	Fixed Trimmer
C44	47		A555-113-2	SI47	D6-470	5W5Q5	GP1K-47	19C25	S. IF Coupling
C45	1500		A19148	BPD-0015	DD-152	1W5D15	801-0015	29C8	S. IF Dec.
C46	.005	600	A194-151	P688-005	D6-502	PTE6D5	811-005	6TM-D5	S. IF Screen
C47	.001	600	A194-145	P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	Diode Load Cap.
C48	.001	600	A194-145	P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	De-emphasis
C49	.05	600	A194-160	P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling
C50	.005	600	A194-151	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling
C51	.001	600	A194-145	P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	Audio Coupling
C52	.05	600	A194-160	P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling
C53	.005	600	A194-151	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Output Plate Byp.
C54	.005	600	A194-151	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Output Plate Byp.
C55	.005	600	A194-151	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Integrator Net.
C56	.01	600	A194-155	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Integrator Net.
C57	.005	600	A194-151	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Integrator Net.
C58	4700	500	A192-163	1467-005	D6-472	1D5D5	GP2M-0047	1FM-25	Vert. Osc. Grid
C59	.05	600	A194-160	P688-05		PTE6S5		6TM-S5	Vert. Discharge

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIR KING PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C60	.01	600	A194-155	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Vert. Sweep Coupling
C61	.001	600	A194-145	P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	Hor. Sync. Coupling
C62	.001	600	A194-145	P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	Hor. Sync. Coupling
C63	.005	600	A194-151	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Hor. Feedback
C64	.005	600	A194-151	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Hor. Feedback
C65	.005	600	A194-151	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Voltage Divider
C66	.005	600	A194-151	P688-005	D6-502	PTE6D5	811-005	6TM-D5	AFC Filter
C67	.1	200	A194-66	P288-1	DF-104	PTE4P1		2TM-P1	AFC Filter
C68	390	500	A190-137	1468-0004	D6-391	5W5T4	GP2K-390	1FM-34	Hor. MV Feedback
C69	3900	500	A195-261	1464-004		1DR5D4		MS-24	Fixed Trimmer
C70	390	500	A190-137	1468-0004	D6-391	5W5T4	GP2K-390	1FM-34	Hor. Discharge
C71	270	500	A190-133	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	Hor. Sweep Coupling
C72	10	2500	A19146						Hor. Feedback
C73	10	2500	A19146						Hor. Feedback
C74	.05	600	A194-160	P688-05	DF-503	PTE6S5		6TM-S5	Hor. Output Screen
C75	.05	600	A194-160	P688-05		PTE6S5		6TM-S5	Damper Filter
C76	.1	600	A194-162	P688-1		PTE6P1		6TM-P1	Damper Filter
C77	500	20000	A1998-2	HV20B	TV1-502				HV Filter
C78	.01	600	A19106	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Line Filter
C79	.01	600	A19106	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Line Filter

* Not used in all models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIR KING PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	10KΩ			Concentrikit			
B	250KΩ			B17-116 *			Contrast control-panel
C	Shaft End		A24109	B13-130 *	RTV-228	SBB-624-S	Volume control-rear
D	Switch			E-187 *			Attach per instructions in "Concentrikit".
				76-1 *			Attach per instructions in "Concentrikit".
R2A	3000Ω		A24114	Q11-112	AM-15-S	AN-7	Vert. linearity control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R2A per instructions
R3A	5 Meg.		A24111	Q11-141	AG-85-S	AN-87	Height control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R3A per instructions
R4A	1 Meg.		A24112	Q11-137	AG-61-S	AN-69	Vert. hold control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R4A per instructions
R5A	100KΩ		A24110	Q11-128	AG-49-S	AN-40	Brightness control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R5A per instructions
R6	100Ω	2	A24116	W-100	43-100	VK-121	Horiz. centering control-Wire Wound
R7	2500Ω	4	A24113		RTV-183	SVP-988	Focus control-Wire Wound
R8	20Ω	2	A24118	W-20 x 10	RTV-3	SVT-901	Vert. centering control-center tapped-Wire Wound

* Additonal parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIR KING PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R9	10KΩ				RF Amp. Grid
R10	4700Ω			BTS-4700	RF Coil Shunt
R11	18KΩ 20%				RF Amp. Plate Coil Shunt
R12	2200Ω			BTS-2200	RF Amp. Decoupling
R13	270KΩ 20%				Conv. Grid Coil Shunt
R14	15KΩ 20%				Conv. Plate
R15	22KΩ 20%				Osc. Grid
R16	4700Ω			BTS-4700	Osc. Plate
R17	3.3 Meg.			BTS-3.3 Meg.	AGC Network-See Note 1
R18	8200Ω		A231-1171		1st Video IF Amp. Grid
R19	82Ω		A231-1123	BTS-82	1st Video IF Amp. Cathode
R20	330Ω		A231-1137	BTS-330	AGC Network
R21	82Ω		A231-1123	BTS-82	Decoupling - -
R22	22KΩ		A231-1181		2nd Video IF Amp. Grid
R23	82Ω		A231-1123	BTS-82	2nd Video IF Amp. Cathode
R24	8200Ω		A232-1171		2nd Video IF Amp. Plate
R25	82Ω 20%		A231-1123	BTS-82	2nd Video IF Amp. Decoupling
R26	1 Meg.		A231-1221	BTS-1 Meg.	AGC Network-See Note 2
R27	2.2 Meg.			BTA-2.2 Meg.	AGC Rectifier Diode Load
R28	82Ω		A231-1123	BTS-82	3rd Video IF Amp. Cathode
R29	82Ω		A231-1123	BTS-82	Decoupling
R30	100KΩ		A231-1197	BTS-100K	AGC Rectifier Diode Load
R31	47KΩ		A231-1189	BTS-47K	Voltage Divider
R32	1000Ω			BTS-1000	Voltage Divider-See Note 1
R33	10KΩ		A231-1173	BTS-10K	Isolation
R34	4700Ω		A231-1165	BTS-4700	Video Det. Diode Load
R35	3.3 Meg.		A231-1233	BTS-3.3 Meg.	Video Amp. Grid-See Note 3
R36	560Ω		A231-1143	BTS-560	Video Amp. Cathode
R37	560Ω		A231-1143	BTS-560	Video Amp. Cathode
R38	2200Ω 20%	2	A232-1157	BTB-2200	Video Amp. Plate
R39	1 Meg.		A231-1221	BTS-1 Meg.	Video Amp. Grid
R40	330Ω		A231-1137	BTS-330	Video Amp. Cathode
R41	330Ω		A231-1137	BTS-330	Video Amp. Cathode-See Note 4
R42	4700Ω	2	A232-1165	BTB-4700	Video Amp. Plate
R43	1800Ω		A231-1155	BTS-1800	Picture Tube Grid-See Note 5
R44	270KΩ		A231-1207	BTS-270K	DC Restorer Load
R45	270KΩ		A231-1207	BTS-270K	Picture Tube Cathode
R46	8200Ω		A231-1171	BTS-8200	Voltage Divider
R47	100KΩ		A231-1197		Sound IF Amp. Grid
R48	100KΩ		A231-1197		Sound IF Amp. Screen
R49	1800Ω		A231-1155	BTS-1800	Sound IF Amp. Decoupling
R50	22KΩ		A231-1181	BTS-22K	Voltage Divider-See Note 1
R51	47KΩ		A231-1189	BTS-47K	Ratio Det. Diode Load
R52	47KΩ		A231-1189	BTS-47K	De-emphasis
R53	3.3 Meg.		A231-1233	BTS-3.3 Meg.	AF Amp. Grid
R54	470KΩ		A231-1213	BTS-470K	AF Amp. Plate
R55	470KΩ		A231-1213	BTS-470K	Audio Output Grid
R56	330Ω		A232-1137	BTA-330	Audio Output Cathode

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIR KING PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R57	3250Ω	7	A21111		Decoupling-Wire Wound
R58	2500Ω	15	A21110	2D-2500	Filter-Wire Wound
R59	1 Meg.	½	A231-1221	BTS-1 Meg.	Sync. Sep. Grid-See Note 6
R60	2700Ω 20%	½	A231-1159	BTS-2700	Sync. Sep. Cathode
R61	3900Ω	½	A231-1163	BTS-3900	Sync. Sep. Plate
R62	3900Ω	½	A231-1163	BTS-3900	Sync. Sep. Plate
R63	22KΩ	½	A231-1181	BTS-22K	Integrator
R64	3900Ω	½	A231-1163	BTS-3900	Differentiator
R65	22KΩ	½	A231-1181	BTS-22K	Integrator
R66	8200Ω	½	A231-1171	BTS-8200	Integrator
R67	1.2 Meg.	½		BTS-1.2 Meg.	Vert. Osc. Grid-See Note 7
R68	470KΩ	½	A231-1213	BTS-470K	Vert. Osc. Plate
R69	47KΩ	½	A231-1189	BTS-47K	Vert. Osc. Plate Decoupling
R70	3900Ω	½	A231-1163	BTS-3900	Vert. Peaking
R71	3.3 Meg.	½	A231-1233	BTS-3.3 Meg.	Vert. Output Grid
R72	330Ω	1	A231-1137	BTS-330	Vert. Output Cathode
R73	3300Ω	2	A233-1137	BTB-3300	Vert. Output Plate Decoupling
R74	47KΩ	2	A233-1189	BTB-47K	Voltage Divider
R75	150KΩ	2	A233-1201	BTB-150K	Voltage Divider
R76	100KΩ	½	A231-1197	BTS-100K	Horiz. Phase Det. Diode Load
R77	100KΩ	½	A231-1197	BTS-100K	Horiz. Phase Det. Diode Load
R78	3.3 Meg.	½	A231-1233	BTS-3.3 Meg.	Horiz. Phase Det. Diode Load
R79	470KΩ	½	A231-1213	BTS-470K	Horiz. AFC Filter Network
R80	2700Ω	½	A231-1159	BTS-2700	Feedback Network
R81	2700Ω	½	A231-1159	BTS-2700	Feedback Network-See Note 8
R82	3900Ω	½	A231-1163	BTS-3900	Horiz. MV Plate
R83	2700Ω	½	A231-1159	BTS-2700	Horiz. MV Cathode
R84	100KΩ	½	A231-1197	BTS-100K	Horiz. MV Grid
R85	270KΩ	½	A231-1207	BTS-270K	Horiz. MV Plate
R86	82Ω	½	A231-1123		Parasitic Supp.
R87	470KΩ	½	A231-1213	BTS-470K	Horiz. Output Grid
R88	150Ω	2	A233-1129	BW-2-150	Horiz. Output Cathode
R89	4700Ω	2	A233-1165	BTB-4700	Horiz. Output Screen
R90	4700Ω	2	A233-1165	BTB-4700	Horiz. Output Screen
R91	1 Meg.	½	A233-1221		HV Filter
R92	82Ω	½	A231-1123	BTS-82	Focus Coil Shunt
R93	1.2Ω	1	A23151	BW-1-1.2	Filament Dropping-Wire Wound
R94	60Ω	10	A21107	1 3/4A-50	Surge Limiter-Wire Wound-See Note 9

Note 1. Not used in all models.
Note 2. Some models use 2 Meg. resistor in this application.
Note 3. Some models use 1 Meg. resistor in this application.
Note 4. Some models use 560Ω resistor in this application.
Note 5. Some models use 3900Ω resistor in this application.
Note 6. Some models use 3.3 Meg. resistor in this application.
Note 7. Some models use 1.5 Meg. resistor in this application.
Note 8. Some models use 6800Ω resistor in this application.
Note 9. Some models use resistors in series to obtain desired value.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: AIR KING PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC @ 1.95A	720VCT @ .240ADC	5VAC @ 3A	6.3VAC @ 7.5A SEC. 4 6.3VAC @ 1.2A	A10109		P-3069	

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: AIR KING PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T2	160Ω	1360Ω	A10106	A-8111 ①	A-3000 ①	TBO-1 ①	Vert. Block Osc. Trans
T3	260Ω	SEC. 1	A10104				Hor. Output Trans.
	Tap @ 58Ω	19Ω Tap @ 13Ω & 1Ω					
		SEC. 2 0Ω					
T4	665Ω	6.7Ω	A10115	A-8112 ①	A-3038	TSO-5	Vert. Output Trans.
T5A	14Ω		A28278-2	DY-7	MD-70F		Hor. Deflection Coil
B	78Ω						Vert. Deflection Coil
T6	1000Ω		A28282				Focus Coil

① Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: AIR KING PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T7	3.8KΩ	3.4Ω	350Ω	.7Ω	Part of SPKR	A-3849 ①	A-3026	RO-301 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: AIR KING PART No.	REPLACEMENT DATA: VIKING PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	PM	3.4Ω	A58121 A58124 ② A5868 ②	10J12	10A31	② Used in some models.
	CONE DIA.	V. C. DIA.				
SP2	9 3/8"	3/4"				

PARTS LIST CONTINUED ON PAGE 15

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	AIR KING PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.240A	63Ω	1.5 Henries	A1406	C-2326 ①	C-2974	TR-3300①	① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	AIR KING PART No.	MEISSNER PART No.	IRC PART No.	
L2	Ant. Coil	.1Ω	.1Ω	*			
L3	Ant. Coil	.1Ω	.1Ω	*			
L4	RF Coil	0Ω		*			
L5	Mixer Grid Coil	0Ω		*			
L6	Osc. Coil	0Ω		*			
L7	Osc. Coil	0Ω		*			
L8	Fil. Choke	.3Ω		*		CLA	.47 microhenries
L9	1st Video IF	.7Ω		*			
L10	2nd Video IF	.3Ω		A3392			
L11	Fil. Choke	.3Ω		A28276		CL-1	8.2 microhenries
L12	3rd Video IF	.3Ω		A3392			
L13	RF Choke	2.7Ω		A28253			
L14	Fil. Choke	.3Ω		A28276		CL-1	8.2 microhenries
L15	4th Video IF	.3Ω		A3392			
L16	Peaking	5Ω		A28255-1			Red dot
L17	Peaking	19Ω		A28255-5			Yellow dot
L18	Peaking	10Ω		A28255-2			White dot
L19	Peaking	10Ω		A28255-2			White dot
L20	Peaking	10Ω		A28255-4			Green dot
L21	Sound IF	2Ω		A28286			
L22	Ratio Det. Trans.	4Ω	1.6Ω	A3393			
L23	Horiz. Freq.	95Ω		A28263			
L24	Horiz. Lin.	35Ω		A28259			
L25	Horiz. Size	.5Ω		A28279			

* Part of tuner.

MISCELLANEOUS

ITEM No.	PART NAME	AIR KING PART No.	NOTES
M1	RF Tuner		
M2	Ion Trap	A54794	

ASTRASONIC MODEL T-3

TRADE NAME	Astrasonic, Model T-3
MANUFACTURER	The Pentron Corp., 611 W. Division St., Chicago 10, Illinois
TYPE SET	AC Operated Tape Recorder with Audio Amplifier
TUBES (FOUR)	Types 6J7 Mic. Pre. Amp., 6SN7GT AF Amp., 6V6GT Bias Osc.-Power Output, 6X4 Rectifier
POWER SUPPLY	110-120 Volts AC RATING .36 Amp. at 117 Volts AC

FOR SERVICE INFORMATION ON TAPE RECORDER SEE CRESTWOOD MODEL CP-201 IN PHOTOFACT SET #118 FOLDER #4 OR RECORD CHANGER MANUAL CM-3.

ASTRASONIC
MODEL T-3

ASTRASONIC
MODEL T-3

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ASTRASONIC PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Mic. Pre-Amp.	6J7	6J7	7R	
V2	AF Amp.	6SN7GT	6SN7GT	8BD	
V3	Bias Osc. - Power Output	6V6GT	6V6GT	7AC	
V4	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ASTASONIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	30	350		AF666J		UP43245		TVL-3782	■ Filter
B	30	350							● Filter
C	30	350							▲ Filter
C2	25	25		PRS25/25		BR255A		TVA-1205	AF Amp. Cathode
C3	.01	100		P488-01	D6-103	PTE4S1	821-01	4TM-S1	Audio Coupling
C4	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Pre-Amp. Screen
C5	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C6	470	500		1468-0005	D6-471	5W5T5	GP2K-470	1FM-35	Tone Comp.
C7	.005	600		P688-005	D6-502	PTE6D5	811-005	6TM-D5	Tone Comp.
C8	470	500		1468-0005	D6-471	5W5T5	GP2K-470	1FM-35	AF Amp. Plate
C9	.02	400		P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C10	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C11	1000	500		1467-001	D6-102	1W5D1	GP2L-001	1FM-21	Tone Comp.
C12	.01	600		P688-01	D6-103	PTE6S1	821-01	6TM-S1	Audio Coupling
C13	.003	600		P688-003	D6-302	PTE6D3	GP2M-003	6TM-D3	Osc. Grid Cap
C14	1800	500							Fixed Trimmer
C15	100	500		1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Osc. Coupling
C16	100	500		1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Osc. Coupling
C17	.003	600		P688-003	D6-302	PTE6D3	GP2M-003	6TM-D3	Output Plate Bypass
C18	1000	500		1467-001	D6-102	1W5D1	GP2L-001	1FM-21	Tone Comp.
C19	1000	500		1467-001	D6-102	1W5D1	GP2L-001	1FM-21	Fixed Trimmer

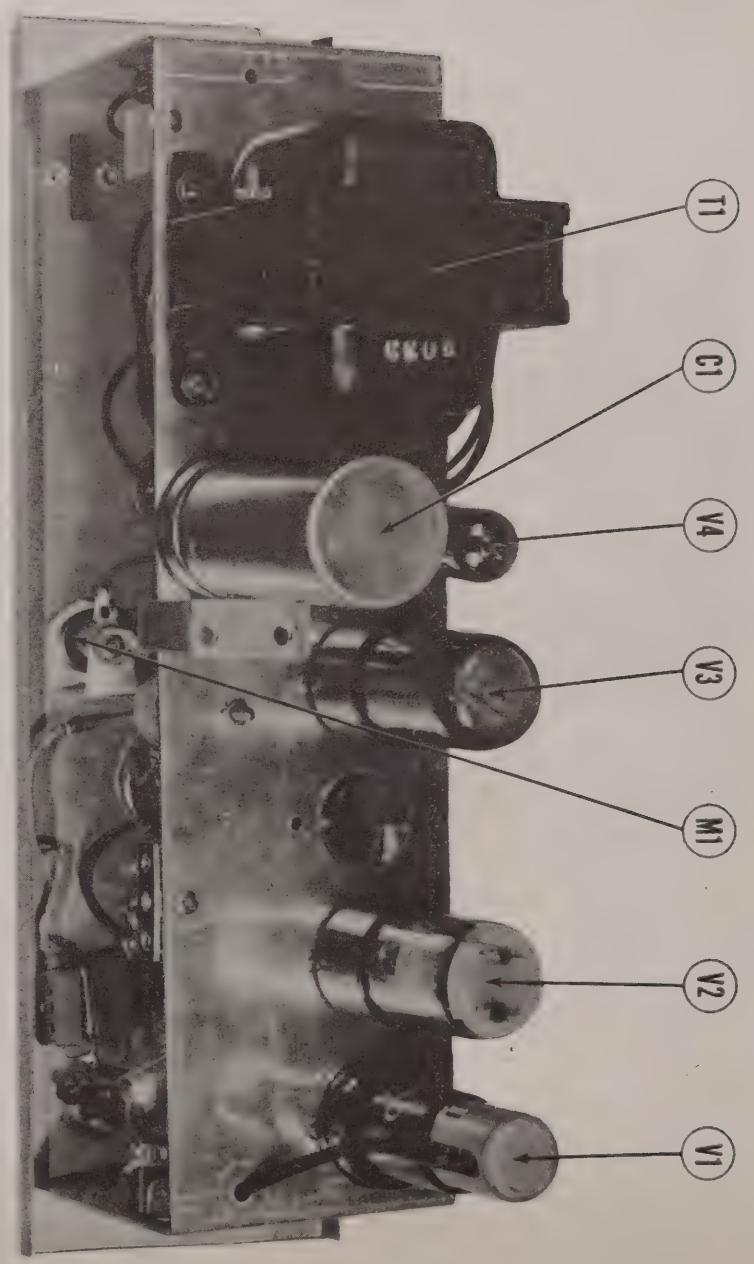
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ASTRASONIC PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	50KΩ	½		Q11-123	AG-44-S	AN-31	Tone control
B	Shaft			Not req.	KSS-3	AK-4	Attach to R1A per instructions
C	Switch			76-1	SWB	K-155	Attach to R1A per instructions
R2A	1Meg Ω	½		Q13-137	AG-63-Z	BSK-70	Volume control
B	Shaft			Not req.	KSS-3	Not req.	Attach to R2A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ASTRASONIC PART No.	IRC PART No.	IDENTIFICATION CODES
R3	220KΩ	½		BTS-220K	Tone Compensation
R4	22KΩ	½		BTS-22K	Tone Compensation
R5	4.7Meg	½		BTS-4.7Meg	Mike Pre-Amp. Grid
R6	1.2Meg	½		BTS-1.2Meg	Mike Pre-Amp. Screen
R7	220KΩ	½		BTS-220K	Mike Pre-Amp. Plate
R8	1Meg	½		BTS-1Meg	1st AF Amp. Grid
R9	1500Ω	½		BTS-1500	1st AF Amp. Cathode
R10	100KΩ	½		BTS-100K	1st AF Amp. Plate
R11	1500Ω	½		BTS-1500	2nd AF Amp. Cathode
R12	47KΩ	1		BTA-47K	2nd AF Amp. Plate
R13	470KΩ	½		BTS-470K	Indicator Network
R14	180KΩ	½		BTS-180K	Indicator Load
R15	100KΩ	½		BTS-100K	Indicator Load
R16	270KΩ	½		BTS-270K	Tone Compensation
R17	47KΩ	½		BTS-47K	Isolation
R18	4700Ω	½			Parasitic Supp
R19	100KΩ	½		BTS-100K	Bias Osc. Grid
R20	220KΩ	½		BTS-220K	Output Grid
R21	270Ω	½		BW-½-270	Output Cathode - Wire Wound
R22	10KΩ	2		BTB-10K	Filter
R23	47KΩ	1		BTA-47K	Filter
R24	1.2Meg	½		BTS-1.2Meg	Voltage Divider

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	ASTRASONIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ .36 Amp.	600VCT .05ADC	6.3VCT @ 2A			PC8407 ①	P3150 ①	PV-50 ②

① Add series resistor to reduce plate voltage
② Drill new mtg. holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		ASTRASONIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	3.6KΩ	3.3Ω	260Ω	.6Ω		A-3849	A-3018	RO-201	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			ASTRASONIC PART No.	VIKING PART No.	QUAM PART No.	
SP1	FIELD	V. C. IMP.		525J4	52A1	
	PM	3.3Ω				
SP2	CONE DIA.	V. C. DIA.				
	5 1/8"	9/16"				

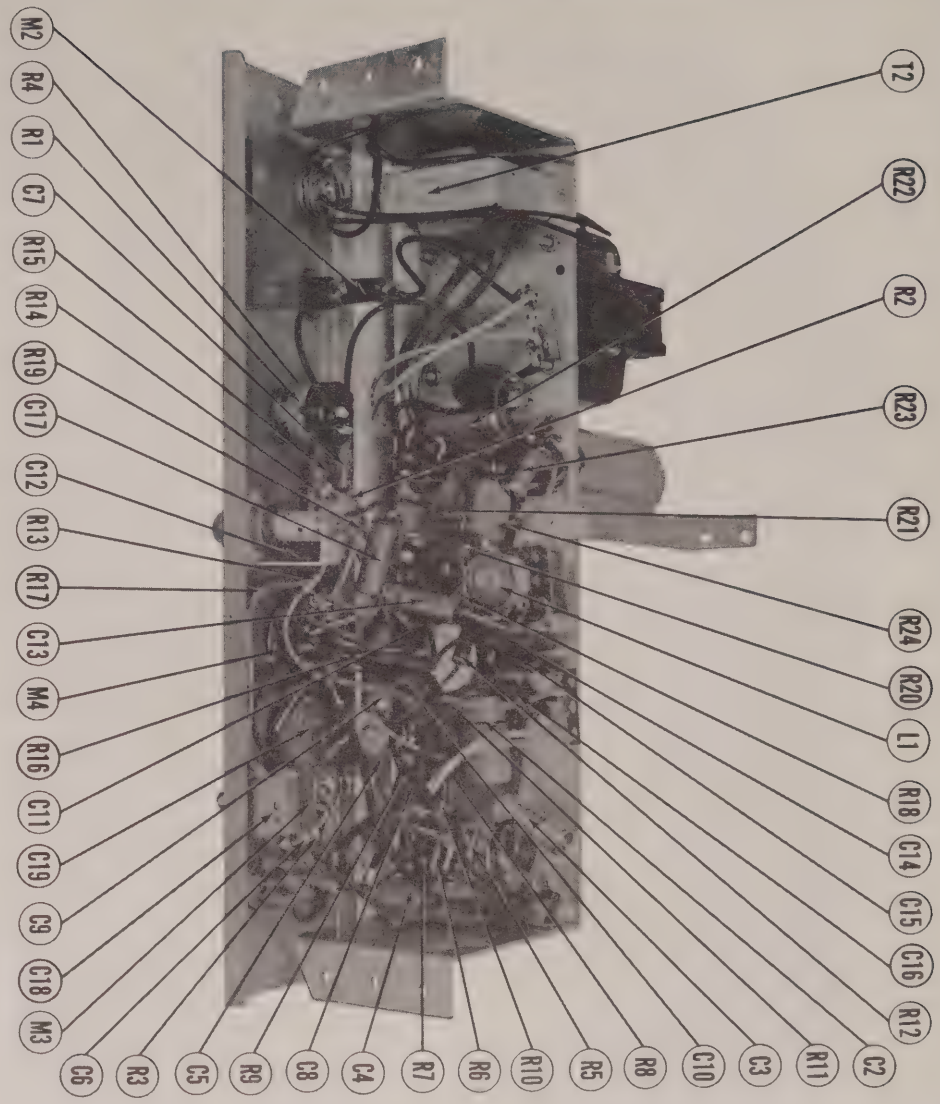
R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	ASTRASONIC PART No.	MEISSNER PART No.	
L1	Bias Osc. Coil	20Ω				Tap at 1.7Ω

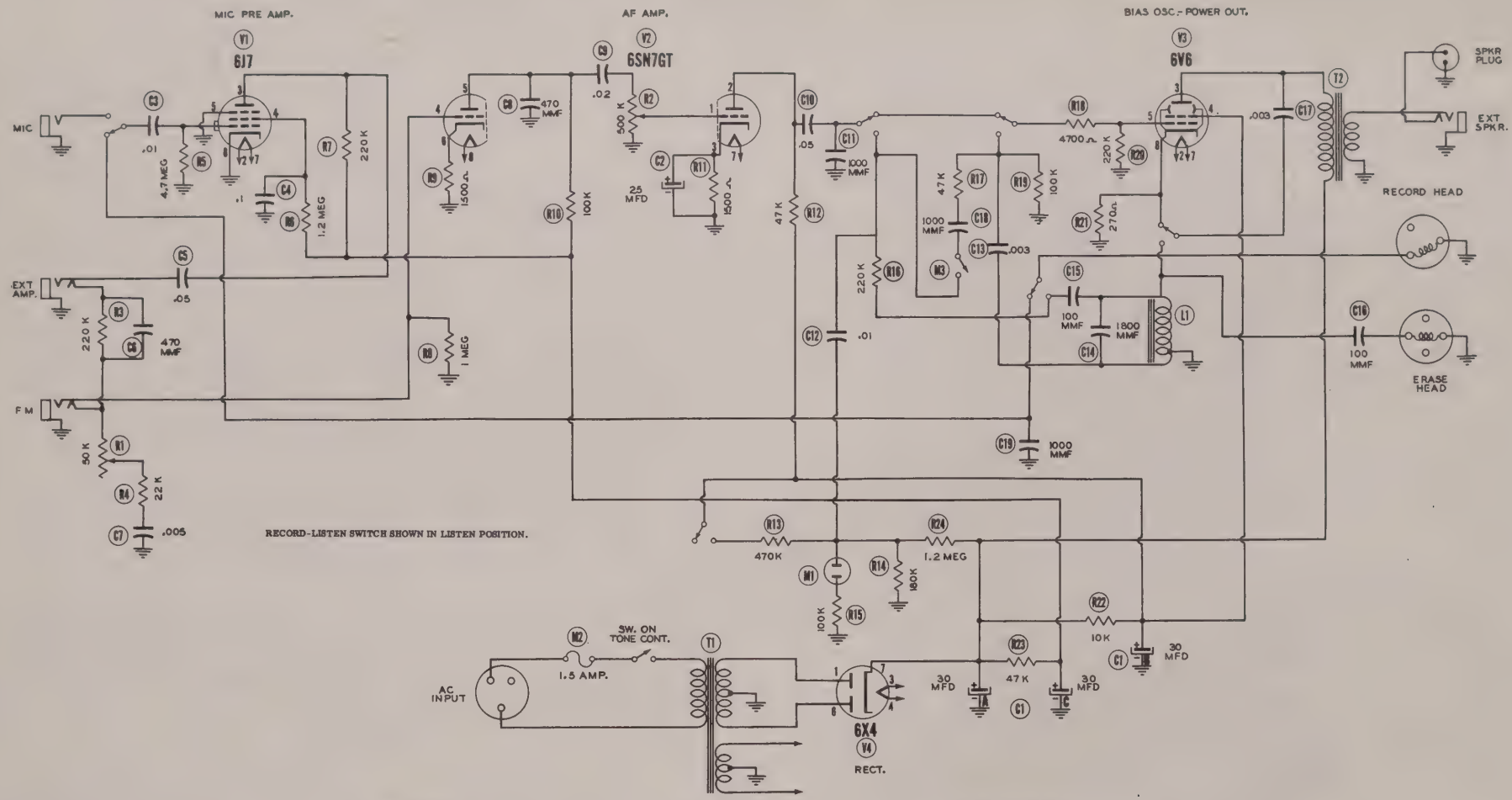
MISCELLANEOUS

ITEM No.	PART NAME	ASTRASONIC PART No.	NOTES
M1	Neon Lamp		Type NE51
M2	Fuse		1.5 Amp. Type AGC
M3	Switch		Speaker On-Off
M4	Switch		Record-Listen

CHASSIS—BOTTOM VIEW



ASTRASONIC MODEL T-3



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J7	0V	¶	▲90VDC #80VDC	▲ 35VDC ▲ 25VDC	0V	▲225VDC #215VDC	¶	0V	▲-1.3VDC #-.6VDC
V 2	6SN7GT	0V	▲ 105VDC # 115VDC	4.5VDC	▲-2VDC # 0V	▲ 55VDC # 65VDC	2.8VDC	¶	¶	
V 3	6V6GT	▲ 0V #	¶	▲340VDC #310VDC	▲225VDC #245VDC	▲-20VDC # 0V	▲-20VDC # 0V	¶	▲ 6VDC # 12VDC	
V 4	6X4	▲ 285VAC # 280VAC	0V	¶	¶	0V	▲ 285VAC # 280VAC	▲350VDC #320VDC		

¶ 6.3VAC MEASURED ACROSS FILAMENTS

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J7	0Ω	.1Ω	†265KΩ	†1.1Meg	0Ω	†47KΩ	.1Ω	0Ω	4.7Meg
V 2	6SN7GT	0Ω	†55KΩ	1.5KΩ	1Meg	†150KΩ	1.5KΩ	.1Ω	.1Ω	
V 3	6V6GT	▲ Inf. #220KΩ	.1Ω	†260Ω	†10KΩ	▲75KΩ #220KΩ	▲ 70KΩ #225KΩ	.1Ω	270Ω	
V 4	6X4	200Ω	Inf.	.1Ω	.1Ω	Inf.	200Ω	100KΩ		

▲ TAKEN IN RECORD POSITION
TAKEN IN LISTEN POSITION

† MEASURED FROM PIN 7 OF V4

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

GENERAL ELECTRIC
MODELS 218, 218 "H"

GENERAL ELECTRIC
MODELS 218, 218 "H"

GENERAL ELECTRIC MODEL 218

TRADE NAME	General Electric, Models 218, 218 "H"		
MANUFACTURER	General Electric Co., Electronics Dept., Electronics Park, Syracuse, New York		
TYPE SET	AC-DC Operated AM-FM Superheterodyne Receiver with Loop Antenna		
TUBES(SIX)	Types 12BA6 FM RF-1st IF Amp., 12BE6 Converter, 12BA6 2nd FM-AM IF Amp., 12AU6 Limiter, 19T8 Discr. - DET-AVC-AF, 50B5 Power Output		
POWER SUPPLY	105-125 Volts AC-DC	RATING	.37 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	540-1620KC	FREQ. MOD.	88-108MC

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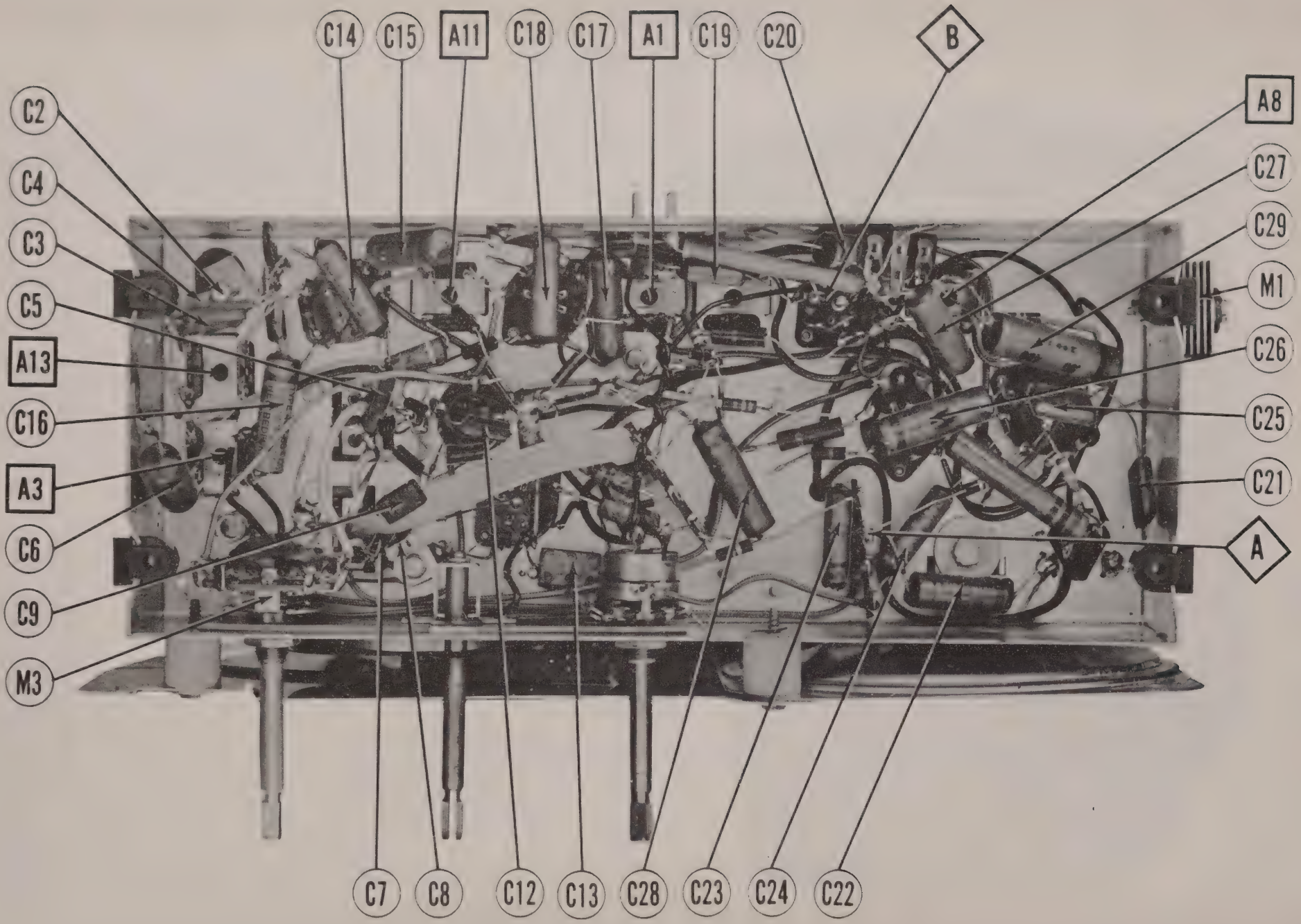
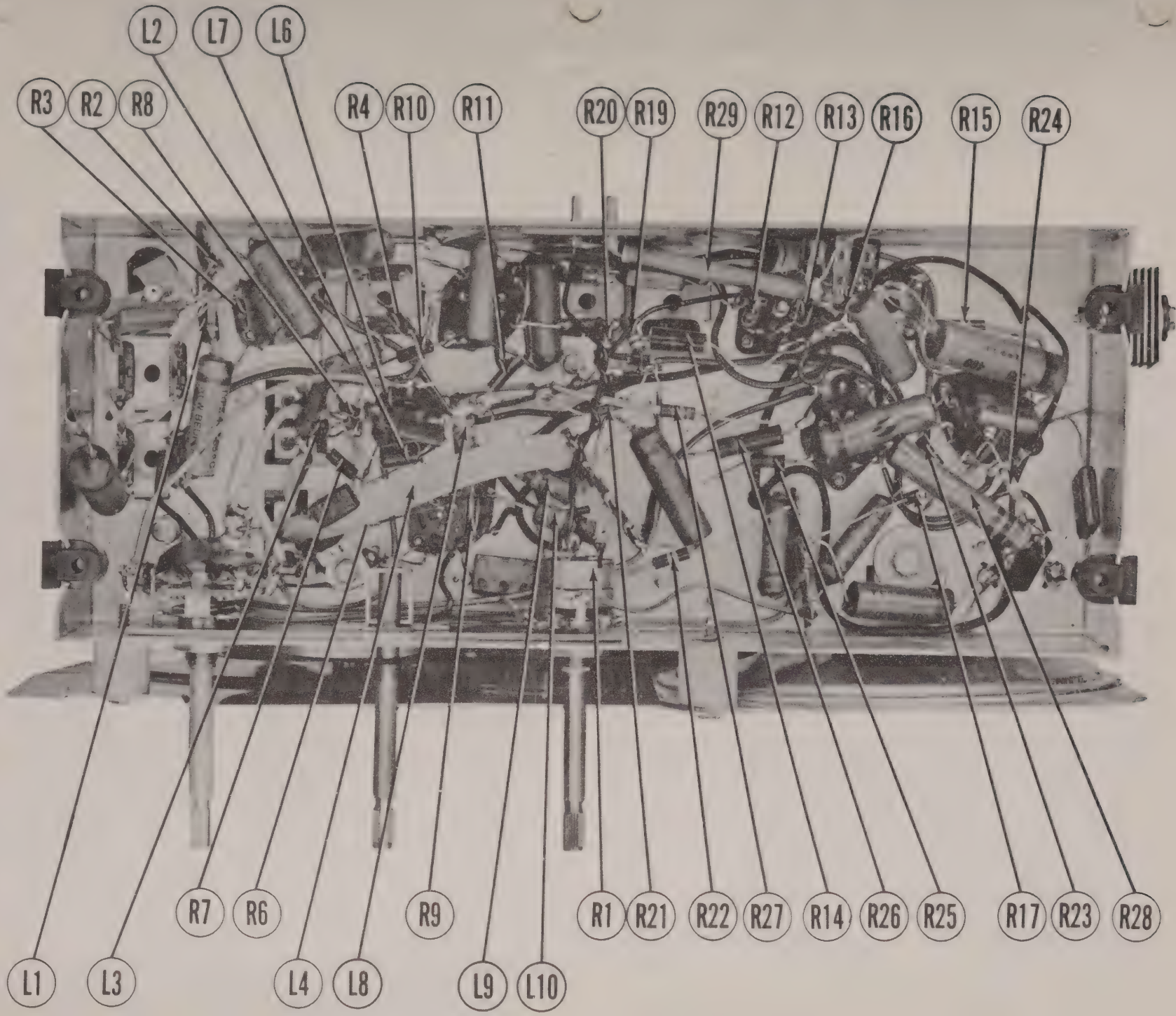

C14
C15
A11
C18
C17
A1
C19
C20
B
A8
C27
C29
M1
C26
C25
C21
A
C2
C4
C3
C5
A13
C16
A3
C6
C9
M3
C7
C8
C12
C13
C28
C23
C24
C22


L2
L7
L6
R3
R2
R8
R4
R10
R11
R20
R19
R29
R12
R13
R16
R15
R24
R7
R6
R9
R1
R21
R22
R27
R14
R26
R25
R17
R23
R28
L1
L3
L4
L8
L9
L10

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial pointer, turn tuning gang fully closed and set the pointer to the dot after the letters "FM" on the dial scale. Use an isolation transformer to protect the test equipment.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (Grid) of 12BA6 (V2). Low side to chassis.	455KC (400 ∿ Mod.)	AM (CW)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1500KC	"	1500KC	"	A5, A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
3.	.1MFD	High side to pin 1 (Grid) of 12BA6 (V3). Low side to chassis.	10.7MC (Unmod.)	FM (CCW)	Tuning gang fully open	DC Probe to Point (A). Common to chassis.	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
4.	.1MFD	"	See remarks column	"	"	"	A8	Detune signal generator to obtain maximum reading. Adjust A8 for maximum deflection.
5.	.1MFD	"	10.7MC	"	"	DC Probe thru 200KΩ to Point (B). Common to chassis.	A9	Adjust for maximum deflection.
6.	.1MFD	High side to pin 1 (Grid) of 12BA6 (V1). Low side to chassis.	"	"	"	"	A10, A11	"
7.	.1MFD	High side to pin 7 (Grid) of 12BE6 (V2). Low side to chassis.	"	"	"	"	A12, A13	Unsolder the copper strap connected to pin 7 of V2. Adjust A12 and A13 for maximum deflection. Resolder the copper strap.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
3.	.01MFD	High side to pin 1 (Grid) of 12BA6 (V1). Low side to chassis.	10.7MC (450KC SWP)	FM (CCW)	Point of non-interferance	Vert. Amp. thru 1 Meg. to Point (B). Low side to chassis.	A9, A10, A11	Adjust for maximum amplitude and symmetry as per figure 1.
4.	.01MFD	High side to pin 7 (Grid) of 12BE6 (V2). Low side to chassis.	"	"	"	"	A12, A13	Unsolder the copper straps connected to pin 7 of V2. Adjust A12 and A13 for maximum amplitude and symmetry as per figure 1. Resolder the copper strap.
5.	.01MFD	High side to pin 1 (Grid) of 12BA6 (V3). Low side to chassis.	"	"	"	"	A7, A8	Adjust A7 so 10.7MC occurs at center of "S" curve as per fig. 2. Adjust A8 for maximum amplitude and straightness of diagonal line. Continue with step 8.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	Two 120Ω carbon res.	Across "FM" ant. terminals with 120Ω in each lead.	108MC (Unmod.)	FM	108MC	DC Probe thru 1 Meg. to Point (B). Common to chassis.	A14	Adjust for maximum deflection.
9.	"	"	98MC	"	Tune for max. deflection.	"	A15	Rock tuning gang while adjusting A15 for maximum deflection.

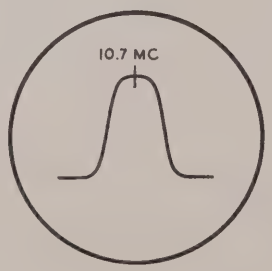


FIG. 1

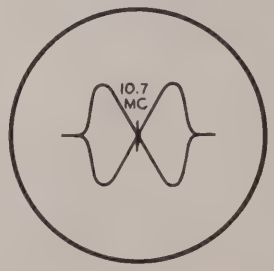


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		G. E. PART No.	STANDARD REPLACEMENT		
V1	FM RF Amp.-1st FM IF Amp.	12BA6	12BA6	7BK	
V2	Converter	12BE6	12BE6	7CH	
V3	2nd FM-AM IF Amp	12BA6	12BA6	7BK	
V4	Limiter	12AU6	12AU6	7BK	
V5	Discr.-AM Det.-AVC-AF Amp.	19T8	19T8	9E	
V6	Power Output	50B5	50B5	7BZ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

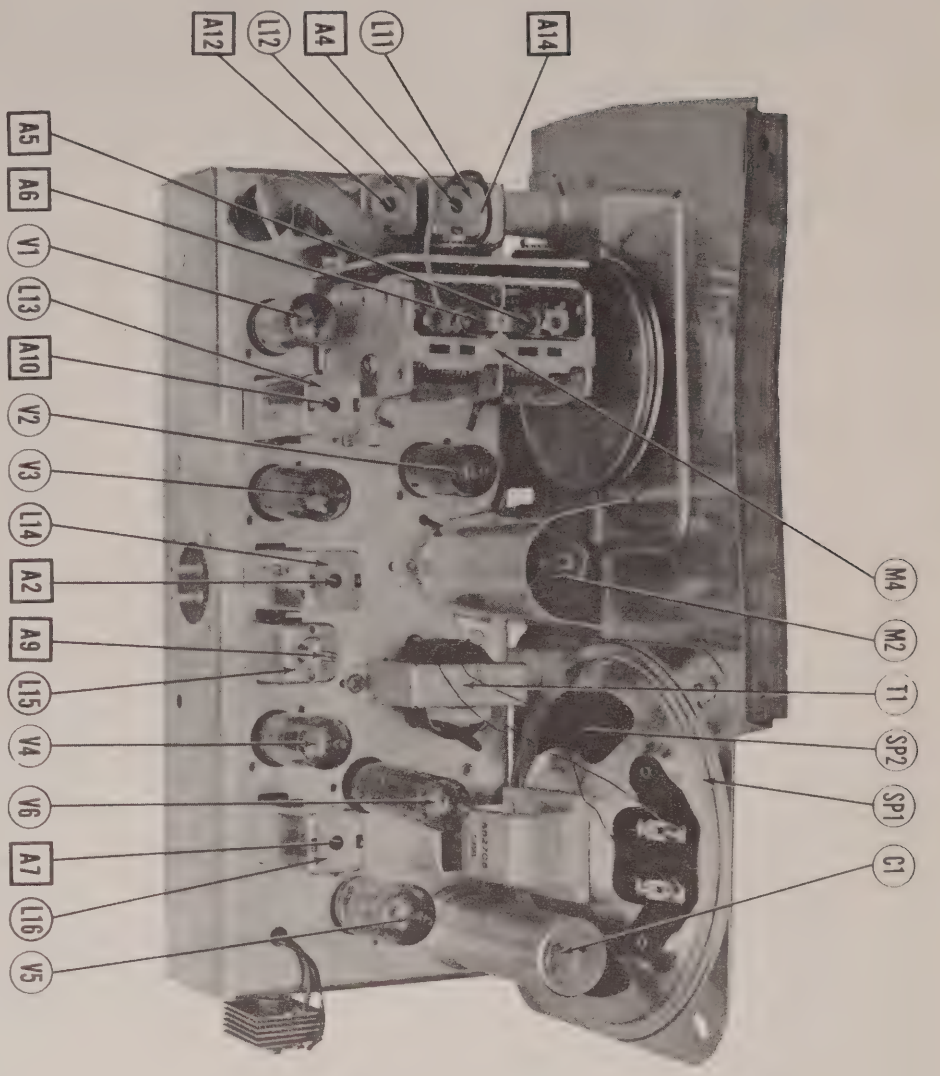
ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA G. E. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	80	150	RCE-101	AF888D		UPE8415		TVL-3440	■ Filter
B	40	150							▲ Filter
C2	470		RCW-176	SI470	D6-471	5W5T5	GP2K-470	19C15	Ant. Isolation
C3	4	500	UCU-001	SI4.7NPO	TCZ-4.7	5R5V5	NPOK-4.7	MS-55	RF Coupling
C4	620	500	UCU-2047						Fixed Trimmer
C5	10	500	RCW-1060	1468-00001	D6-100	5W5Q1	GP1K-10	MS-41	RF Coupling
C6	.05	200	UCC-045	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C7	47	500	RCW-1043	1468-00005	D6-470	5W5Q5	GP1K-47	1FM-45	Osc. Grid Cap
C8	4		RCW-1075						Fixed Trimmer
C9	39	500	RCW-1057	1468-00004	D6-390	5W5Q4	GP1K-39	1FM-44	Osc. Feedback *
C10	15		RCW-2027						Fixed Trimmer †
C11	22		RCW-1077						Fixed Trimmer †
C12	20	500	RCW-1070	SI20NPO	TCZ-20	5R5Q2	NPOK-20	MS-42	Osc. Grid Cap
C13	100	500	UCU-028	1468-0091	D6-101	5W5T1	GP1K-100	1FM-31	Osc. Anode Bypass
C14	.005	400	UCC-039	P688-005	D6-502	PTE6D5	811-005	6TM-D5	FM RF- IF Dec.
C15	.01	200	UCC-040	P488-01	D6-103	PTE4S1	821-01	4TM-S1	FM RF-IF Fil.
C16	.01	400	UCC-040	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Conv. Plate Dec.
C17	.005	400	UCC-039	P688-005	D6-502	PTE6D5	811-005	6TM-D5	2nd FM-AM IF Dec.
C18	.005	200	UCC-039	P688-005	D6-502	PTE6D5	811-005	6TM-D5	2nd FM-AM IF Cath.
C19	33	500	UCU-516	SI33	D6-330	5W5Q4	GP1K-33	19C24	IF Coupling
C20	.01	400	UCC-040	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Limiter Dec. ‡
C21	470	500	UCU-044	1468-0005	D6-471	5W5T5	GP2K-470	1FM-35	RF Bypass
C22	.001	400		P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	De-emphasis
C23	.003	200	UCC-037	P688-003	D6-302	PTE6D3	GP2M-003	6TM-D3	Tone Comp.
C24	.005	200	UCC-039	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling
C25	47	500	UCU-020	1468-00005	D6-470	5W5Q5	GP1K-47	1FM-45	AF Amp. Plate
C26	.01	400	UCC-040	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Audio Coupling
C27	.005	600	UCC-039	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Output Plate Bypass
C28	.01	200	UCC-040	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Output Filament
C29	.05	400	UCC-045	P488-05	DF-503	PTE4S5		4TM-S5	Line Filter

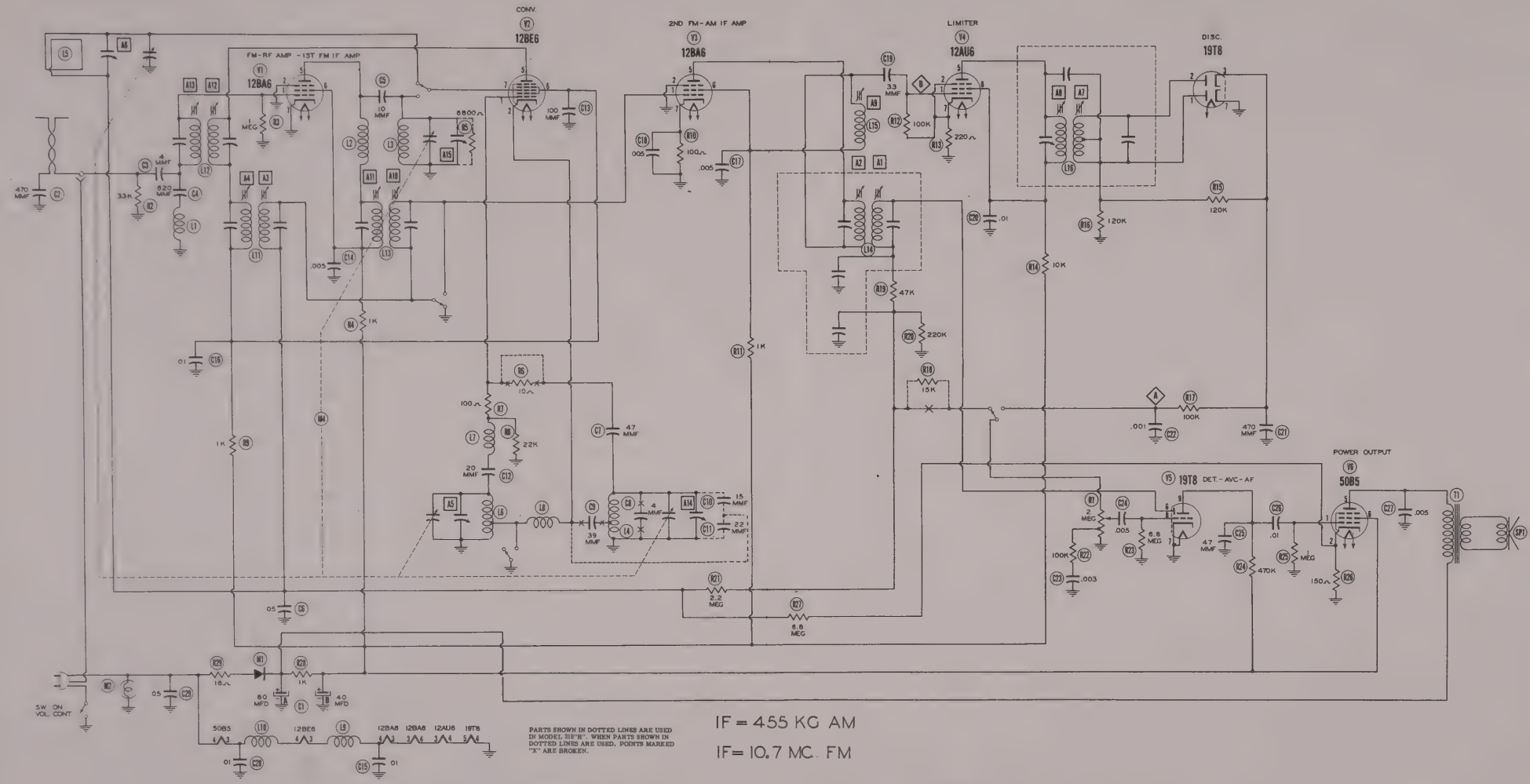
* Not Used In Model 218 "H" Version.
† Used Only In Model 218 "H" Version.
‡ Some Models Use .02MFD In This Application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA G. E. PART No.	IEC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	2Meg	½	RRC-111	Q18-139X	AT-116	ANT-78	Volume control - tapped @ 1meg
B	Shaft		Not req.	Not req.	KSS-3	AK-4	Attach to R1A per instructions
C	Switch		Not req.	76-1	SW-A	K-155	Attach to R1A per instructions

CHASSIS—TOP VIEW





PARTS SHOWN IN DOTTED LINES ARE USED IN MODEL 310"B". WHEN PARTS SHOWN IN DOTTED LINES ARE USED, POINTS MARKED "X" ARE BROKEN.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12BA6	-.6VDC	0V	44VAC	58VAC	80VDC	80VDC	0V		
V 2	12BE6	‡8-2.2VDC ▲8-5.5VDC	0V	56VAC	58VAC	80VDC	80VDC	‡ 0V ▲ 0V		
V 3	12BA6	0V	0V	44VAC	32VAC	80VDC	80VDC	1.2VDC		
V 4	12AU6	-.4VDC	0V	32VAC	20VAC	‡ 70VDC ▲ 35VDC	55VDC	‡ .6VDC ▲ 1VDC		
V 5	19T8	‡-1.2VDC ▲-.8VDC	‡-1.2VDC ▲-.8VDC	-.1VDC	0V	20VAC	‡ -.6VDC ▲-3.5VDC	0V	-.7VDC	37VDC
V 6	50B5	0V	6.3VDC	88VAC	112VAC	125VDC	90VDC	0V		

‡ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12BA6	1Meg	0Ω	35Ω	43Ω	†2KΩ	†2KΩ	0Ω		
V 2	12BE6	22KΩ ‡ .7Ω	.7Ω	45Ω	53Ω	†2KΩ	†2KΩ	‡ 0Ω ▲ 1.6Meg		
V 3	12BA6	▲ 1.8Meg	0Ω	35Ω	25Ω	†2KΩ	†2KΩ	100Ω		
V 4	12AU6	100KΩ	0Ω	25Ω	18Ω	†1KΩ	†1KΩ	320Ω		
V 5	19T8	120KΩ	120KΩ	240KΩ	0Ω	18Ω	220KΩ	0Ω	6.8Meg	†470KΩ
V 6	50B5	1Meg	150Ω	55Ω	70Ω	†140Ω	†1KΩ	1Meg		

‡ TAKEN IN FM POSITION
▲ TAKEN IN AM POSITION
† MEASURED FROM OUTPUT OF M1

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	G. E. PART No.	IRC PART No.	
R2	33KΩ	½	URD-085	BTS-33K	Antenna Isolation
R3	1Meg	½	URD-121		RF-IF Amp. Grid
R4	1000Ω	½	URD-049	BTS-1000	RF-IF Amp. Decoup
R5	6800Ω	½	URD-069	BTS-6800	FM-RF Choke Shunt - See Note 1
R6	10Ω	½	URD-001		Parasitic Supp - See Note 2
R7	100Ω	½	URD-025		Parasitic Supp
R8	22KΩ	½	URD-081		Osc. Grid
R9	1000Ω	½	URD-049	BTS-1000	Decoup
R10	100Ω	½	URD-025	BTS-100	2nd IF Amp. Cathode
R11	1000Ω	½	URD-049	BTS-1000	2nd IF Amp. Decoup
R12	100KΩ	½	URD-097	BTS-100K	Limiter Grid
R13	220Ω	½	URD-033	BTS-220	Limiter Cathode
R14	10KΩ	1	URD-073	BTA-10K	Limiter Decoup
R15	120KΩ	½	URD-099	BTS-120K	Disc Diode Load
R16	120KΩ	½	URD-099	BTS-120K	Disc Diode Load
R17	100KΩ	½	URD-097	BTS-100K	De-emphasis
R18	15KΩ	½	URD-077	BTS-15K	Diode Filter - See Note 1
R19	47KΩ	½	URD-089	BTS-47K	Diode Filter
R20	220KΩ	½	URD-105	BTS-220K	Diode Load
R21	2.2Meg	½	URD-129	BTS-2.2Meg	AVC Network
R22	100KΩ	½	URD-097	BTS-100K	Tone Compensation
R23	6.8Meg	½	URD-141	BTS-6.8Meg	AF Amp. Grid
R24	470KΩ	½	URD-113	BTS-470K	AF Amp. Plate
R25	1Meg	½	URD-121	BTS-1Meg	Output Grid
R26	150Ω	1	URE-029	BTA-150	Output Cathode
R27	6.8Meg	½	URD-141	BTS-6.8Meg	Feedback
R28	1000Ω	2	URF-049	BTB-1000	Filter
R29	18Ω	½	URD-007		Rectifier Ballast

Note 1. Used Only In Models 218H
Note 2. Used Only In Model 218.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		G. E. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2.4KΩ	3.4Ω	140Ω	.5Ω	RTO-039	A-3876	A-2928	RO-2	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
	FIELD	V. C. IMP.	G. E. PART No.	VIKING PART No.	QUAM PART No.	
SP1	PM	3.4Ω	UOP-577	525J4	52A1	
	CONE DIA.	V. C. DIA.				
SP2	5 1/8"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	G. E. PART No.	MEISSNER PART No.	IRC PART No.	
L1	FM Ant. Coil	0Ω		RLI-088			
L2	RF Choke	.2Ω		RLI-087		CLA	4.7 Microhenries
L3	FM RF Coil	0Ω		RLB-029			
L4	FM Osc. Coil	0Ω		RLC-093			
L5	Loop Antenna	3.3Ω		RAB-104			Includes cabinet back
L6	AM Osc. Coil	8.5Ω		RLC-092	14-1073		Tap at .5Ω
L7	RF Choke	.7Ω		RLI-085			
L8	RF Choke	.2Ω		RLI-087		CLA	4.7 Microhenries
L9	Fil. Choke	1.8Ω		RLI-085		CLA	2.2 Microhenries
L10	Fil. Choke	1.8Ω		RLI-085		CLA	2.2 Microhenries
L11	1st AM IF	20Ω	20Ω	RTL-097	16-6678		
L12	1st FM IF	.7Ω	.7Ω	RTL-099	16-3487		
L13	2nd FM IF	.7Ω	.7Ω	RTL-099	16-3487		
L14	2nd AM IF	18Ω	18Ω	RTL-098			
L15	3rd FM IF	1.8Ω		RTL-100			
L16	Disc. Trans.	.7Ω	.8Ω	RTD-006			

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

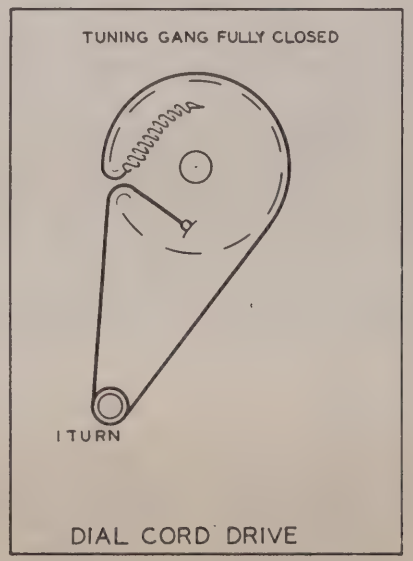
ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	G. E. PART No.	SYLVANIA PART No.	SELETRON PART No.	
M1	.078A	RER-001	NC-5	5M1	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					G. E. PART No.		
M2	Bayonet	115		Clear			

MISCELLANEOUS

ITEM No.	PART NAME	G. E. PART No.	NOTES
M3	Switch	RSW-072	AM-FM
M4	2 Gang Var. Cap	RCT-038	(15-473MMF, 15-153MMF)
A6	Trimmer	RCY-056	BC Ant. Adj.
A14	Trimmer	RCY-055	FM Osc. Adj.
	Cabinet	RAU-309	
	Knob	RDK-177	
	Pointer	RDP-048	
	Dial Window	RDW-029	



PHOTOFACT* Folder

MOTOROLA MODELS 14K1BH, 14T3, Series 16F1, 16K2, 16T1, 17F1, 2, 3, 4, 5; 17K1, 3, 4; 17T1, 2, 3

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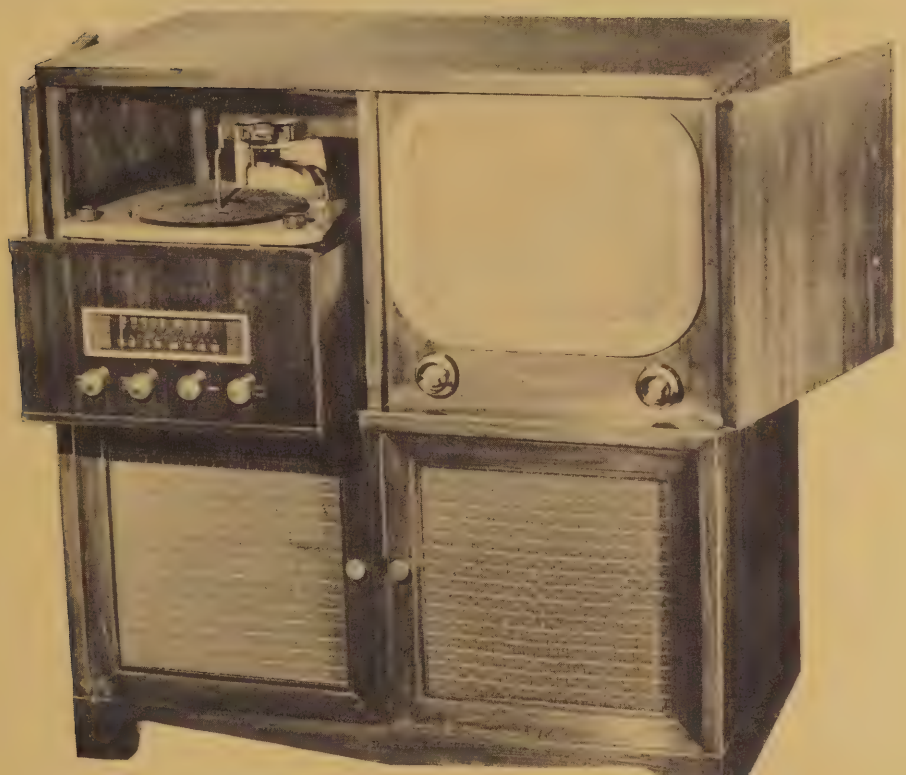

MODEL 17F5

MOTOROLA MODELS 14K1BH, 14T3, Series 16F1, 16K2, 16T1, 17F1, 2, 3, 4, 5; 17K1, 3, 4; 17T1, 2, 3

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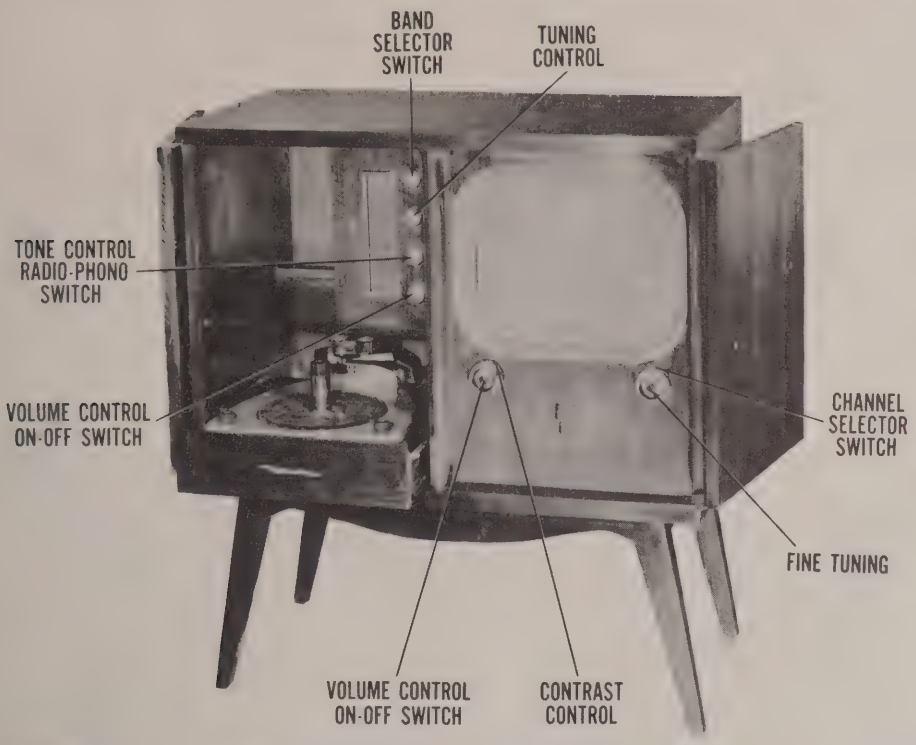

MOTOROLA MODEL 17F2WA

TRADE NAME	Motorola TV Chassis	Radio Chassis	Used In Models
	TS-89	HS-234	16F1BH, H
	TS-89	HS-253	17F1A, BA, 17F2WA, 17F3BA, 17F4A
	TS-89	HS-261	17F5A, BA
	TS-89 (TV "Only" Receivers)		16T1BH, H, 17K3A, BA, 17T1A, BA, 17T2A, BA, 17T3A
	TS-94 (TV "Only" Receivers)		16K2BH, H
	TS-95 (TV "Only" Receivers)		17K1A, BA, 17K4A
	TS-115 (TV "Only" Receivers)		14K1BH, H
	TS-118	HS-253	17F1, B, 17F2W, 17F3B, 17F4
	TS-118	HS-261	17F5, B
	TS-118 (TV "Only" Receiver)		17K3, B, 17T1, B, 17T2, B, 17T3

MANUFACTURER	Motorola, Inc., 4545 Augusta Blvd., Chicago 51, Illinois
TYPE SET	TV-AM-FM-Phono Combination Receiver (Some Models TV "Only")
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATINGS	1.8 Amp. @ 117 Volts AC (TV) .56 Amp. @ 117 Volts AC (Radio)
TUNING RANGES	(TV) Channels 2 thru 13 (FM) 88-108 MC (AM) 535-1620KC

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FOR SERVICE INFORMATION ON RADIO CHASSIS HS-234 - SEE MOTOROLA MODEL 16F1 PHOTOFACT SET #102 FOLDER #8.

RECORD CHANGER UNIT - MOTOROLA MODEL RC-36A

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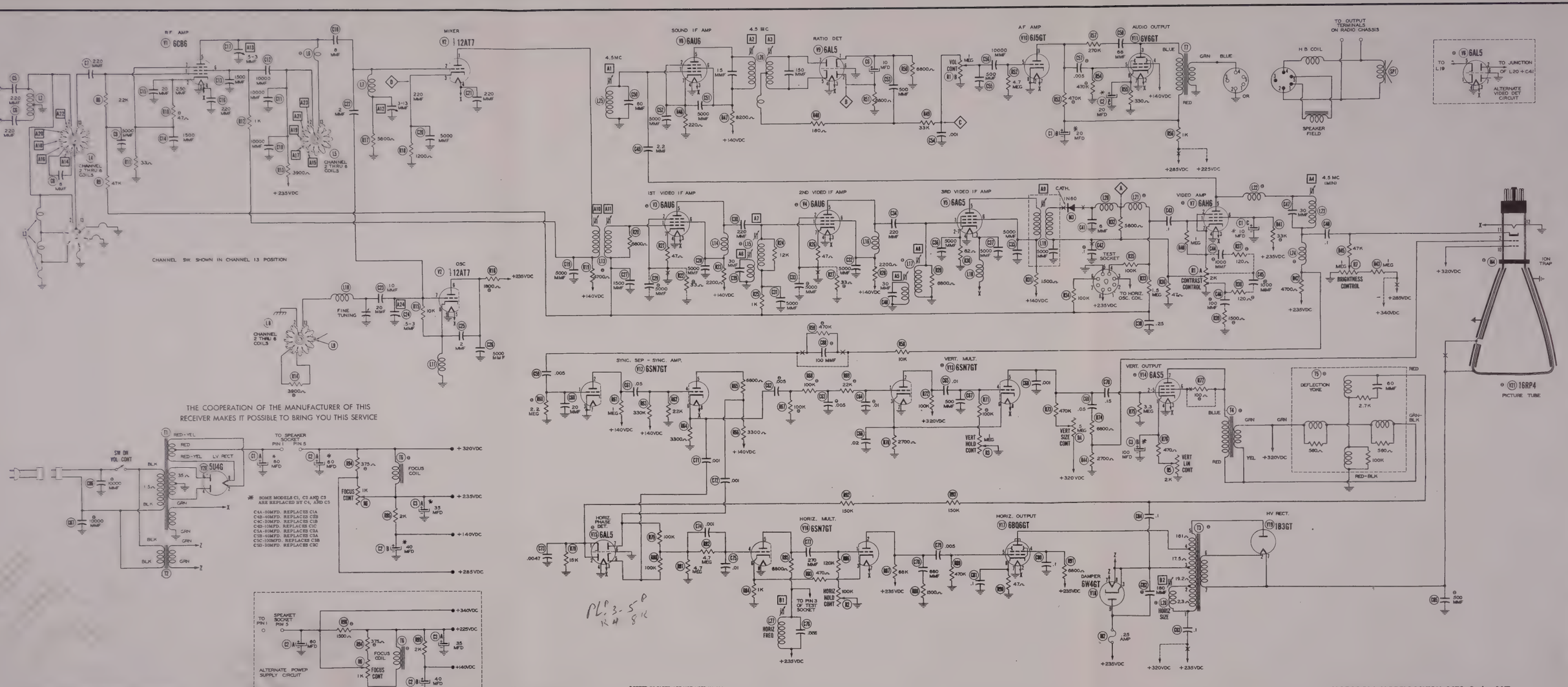
DATE 1-51 SET 121 FOLDER 10

MOTOROLA MODELS 14K1BH, , Series 16F1, 16K2, 16T1, 17F1, 2, 3, 4, 5; 17K1, 3, 4; 17T1, 2, 3



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

* SOME MODELS C1, C2 AND C3 ARE REPLACED BY C4, AND C5

C4A-50MFD. REPLACES C1A
C4B-40MFD. REPLACES C1B
C4C-30MFD. REPLACES C1B
C4D-10MFD. REPLACES C1C
C5A-40MFD. REPLACES C2A
C5B-40MFD. REPLACES C3A
C5C-100MFD. REPLACES C3B
C5D-30MFD. REPLACES C3C

PL P. 3-5 R M 8 K

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.

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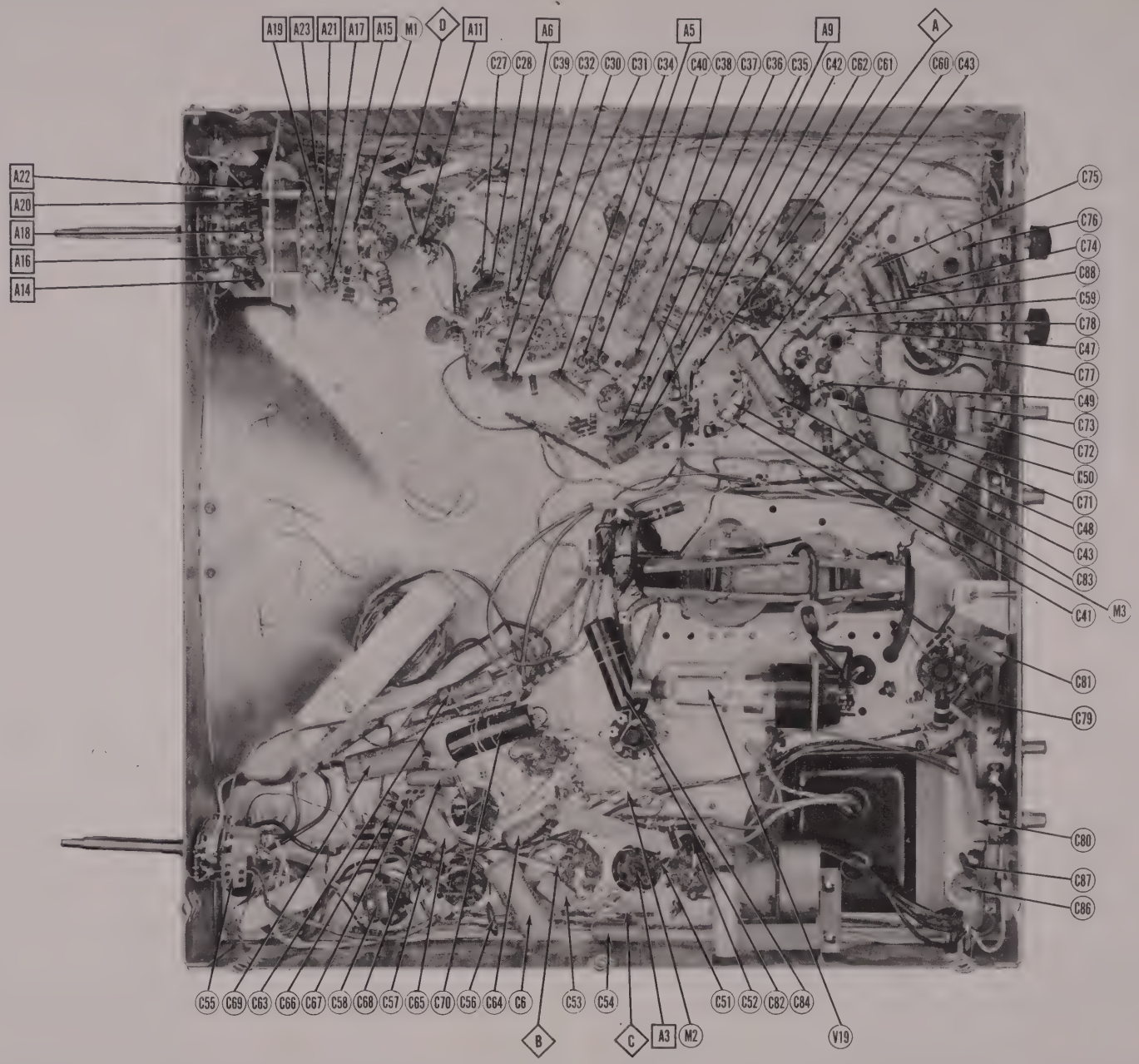
MOTOROLA MODELS 14K1BH, 14T3, Series 16F1, 16K2, 16T1, 17F1, 2, 3, 4, 5; 17K1, 3, 4; 17T1, 2, 3

MOTOROLA MODELS 14K1BH, , Series 16F1, 16K2, 16T1, 17F1, 2, 3, 4, 5; 17K1, 3, 4; 17T1, 2, 3

TUBE PLACEMENT CHART



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

CHASSIS TOP VIEW

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Remove the 6BQ6 horizontal output tube and connect a 2500Ω 25 watt resistor between the B+ end of the fuse and chassis. This will eliminate the high voltage shock hazard and also prevent erroneous indications during alignment.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (Grid) of 6AH6 (V7). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any channel not used locally.	Vert. Amp. to Point (B). Low side to chassis.	A1, A2	Disconnect stabilizer capacitor C6. Adjust for maximum amplitude and symmetry as per figure 1.
2.	.001MFD	"	"	"	"	Vert. Amp. to Point (C). Low side to chassis.	A3	Reconnect capacitor C6. Adjust A3 so 4.5MC occurs at center of crossover lines as per figure 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (Grid) of 6AH6 (V7). Low side to chassis.	4.5MC (Unmod.)	Any channel not used locally	DC Probe to Point (B). Common to chassis.	A1, A2	Adjust for maximum deflection.
2.	.001MFD	"	"	"	DC Probe to Point (C). Common to chassis.	A3	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
3.	.001MFD	High side to pin 1 (Grid) of 6AH6 (V7). Low side to chassis.	4.5MC (Unmod.)	Any channel not used locally	DC Probe thru detector to pin 11 of picture tube. Common to chassis.	A4	Adjust for MINIMUM deflection.

VIDEO IF ALIGNMENT

Unsolder the end of R16 which is connected to the terminal strip adjacent to V2. This will prevent erroneous indications caused by the local oscillator. Connect the negative lead of a 3 volt battery to the junction of R33 and C38, connect the positive lead to chassis. Connect an .01MFD ceramic disc capacitor across the mixer grid resistor R17.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.005MFD	High side to pin 1 (Grid) of 6AU6 (V3). Low side to chassis.	24MC (10MC SWP)	21.9MC 22.7MC 26.6MC 27.3MC	Any	Vert. Amp. to Point (A). Low side to chassis.	A5	Adjust for MINIMUM marker indication at the 21.9MC point on response curve.
5.	.005MFD	"	"	"	"	"	A6	Adjust for MINIMUM marker indication at the 27.3MC point on response curve.
6.	.005MFD	"	"	"	"	"	A7	Adjust to place the 26.6MC marker at 60% on high side of response curve.
7.	.005MFD	"	"	"	"	"	A8	Adjust to place the 22.7MC marker at 60% on low side of response curve.
8.	.005MFD	"	"	"	"	"	A9	Adjust for flat-topped symmetrical response as per figure 3. Repeat steps 4 and 5 and recheck IF response.
9.	.005MFD	High side to pin 2 (Grid) of 12AT7 (V2). Low side to chassis.	"	21.9MC 22.9MC 26.4MC 27.3MC	"	"	A10, A11	Turn cores A10 and A-11 fully out. Adjust both cores simultaneously inward until response curve similar to figure 4 is obtained. The dip which may appear in the center should not exceed 10%.
10.	.005MFD	"	"	"	"	"	A12	Remove the .01 capacitor across R17. A12 should be adjusted to the center of the IF response curve. As A12 is adjusted a point will be found where the amplitude of the IF response is evenly reduced. This point is the proper frequency setting of the trap.

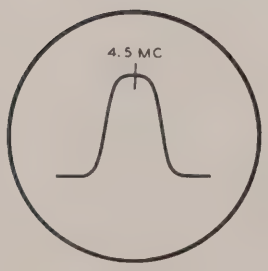


FIG. 1

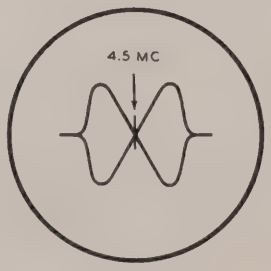


FIG. 2

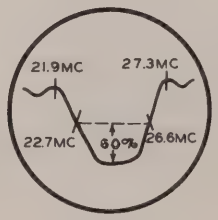


FIG. 3

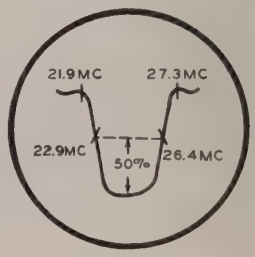


FIG. 4

TV ALIGNMENT INSTRUCTIONS (CONT.)

ANTENNA AND RF ALIGNMENT

Remove the bias battery and short the AGC line to chassis.
On the low band channels the antenna coils (L4) are tuned to the video carrier frequency and the RF coils (L5) are tuned to the sound carrier frequency.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	195MC (10MC SWP)	193.25MC 197.75MC	10	Vert. Amp. thru 150KΩ to Point ◇. Low side to chassis.	A13	Adjust to place the sound and video markers as shown in figure 5.
12.	"	"	177MC (10MC SWP)	175.25MC 179.75MC	7	"		Check all high band channels for response curve similar to figure 5. If necessary expand or compress turns of L6 for proper response. If L6 is adjusted it may be necessary to readjust A13. Recheck all high band channels.
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			207MC (10MC SWP)	205.25MC 209.75MC	12			
			213MC (10MC SWP)	211.25MC 215.75MC	13			
13.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A14, A15	Expand or compress A14 coil turns for maximum amplitude at the Video carrier frequency. Adjust A15 turns for maximum amplitude at the sound carrier frequency as per figure 6.
14.	"	"	79MC (10MC SWP)	77.25MC 81.75MC	5	"	A16, A17	Adjust the antenna coil at the video carrier frequency and the RF coil at the sound carrier frequency on each of the low band channels.
			69MC (10MC SWP)	67.25MC 71.75MC	4		A18, A19	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A20, A21	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A22, A23	

OSCILLATOR ALIGNMENT

Resolder R16 to the terminal from which it was removed.
Remove the short from the AGC line and reconnect the 3 volt bias battery as outlined under Video IF Alignment. Turn the fine tuning control to the mid-position of its range; at this position the slot in the shaft will be horizontal.
Before beginning oscillator alignment, check to make sure that the grid choke L7 and the oscillator coupling capacitor C22 are dressed away from each other.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	207MC (10MC SWP)	209.75MC	12	Vert. Amp. to Point ◇. Low side to chassis.	A24	Adjust to place the sound marker in "notch" as shown in figure 7.
16.	"	"	189MC (10MC SWP)	191.75MC	9	"	L9	Expand or compress coil turns to place sound marker in "notch" as per figure 7.
17.	"	"	213MC (10MC SWP)	215.75MC	13	"		Check to see if the sound marker can be properly placed within 30° rotation of the fine tuning control. If not, expand or compress turns of L10 until the 30° requirement is met. If L10 is changed, recheck A24 on channel 12.
18.	"	"	201MC (10MC SWP)	203.75MC	11	"		Check all high band channels to see that the sound marker can be properly placed within 30° rotation of the fine tuning control. If any channel fails to meet the 30° requirement, a compromise must be made by readjusting channel 9 or 12 depending on which is closer to the channel which is off frequency.
			195MC (10MC SWP)	197.75MC	10			
			183MC (10MC SWP)	185.25MC	8			
			177MC (10MC SWP)	179.75MC	7			
19.	"	"	85MC (10MC SWP)	87.75MC	6	"	L8	Adjust each channel segment of L8 to place sound marker in "notch" as shown in figure 7.
			79MC (10MC SWP)	81.75MC	5			
			69MC (10MC SWP)	71.75MC	4			
			63MC (10MC SWP)	65.75MC	3			
			57MC (10MC SWP)	59.75MC	2			

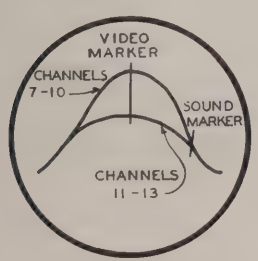


FIG. 5

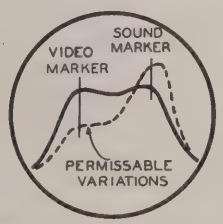


FIG. 6

FIG. 7

RADIO ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial pointer, turn tuning gang fully closed and set the pointer even with the outside edge of the 55 at the low frequency end of the dial scale.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
20.	.1MFD	High side to pin 7 (Grid) of 6BA7 (V23). Low side to chassis.	455KC (400 ∿ Mod.)	AM (CW)	Tuning gang fully open	Across voice coil	A25, A26, A27, A28	Adjust for maximum output.
21.	.1MFD	" "	1620KC	"	"	"	A29	Adjust for maximum output. If A29 shows insufficient range, turn trimmer on opposite side of gang to 1/2 turn from tight and readjust A29.
22.		Loop	1400KC	"	Tune for max. output	"	A30	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from Point E to chassis. The junction of these two resistors is alignment Point G as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
23.	.001MFD	High side to pin 7 (Grid) of 6BA7 (V23). Low side to chassis.	10.7MC (Unmod.)	FM (CCW)	Tuning gang fully open	DC Probe to Point (E). Common to chassis.	A31, A32, A33, A34, A35	Adjust for maximum deflection.
24.	.001MFD	"	"	"	"	DC Probe to Point (F). Common to Point (G).	A36	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Continue with step 25.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
23.	.001MFD	High side to pin 1 (Grid) of 6BA6 (V24). Low side to chassis.	10.7MC (450KC SWP)	FM (CCW)	Tuning gang fully open	Vert. Amp. to Point (E). Low side to chassis.	A31, A32, A33	Disconnect stabilizer capacitor C90. Adjust for maximum amplitude and symmetry as per figure 8.
24.	.1MFD	High side to pin 7 (Grid) of 6BA7 (V23). Low side to chassis.	"	"	"	"	A34, A35	"
25.	.001MFD	"	"	"	"	Vert. Amp. to Point (F). Low side to chassis.	A36	Reconnect capacitor C90. Adjust A36 so 10.7MC occurs at center of crossover lines as per figure 9. SLIGHTLY retouch A31 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
26.	270Ω carbon res.	High side thru 270Ω to "FM" antenna terminal. (open link). Low side to chassis.	105MC (Unmod.)	FM	105MC	DC Probe to Point (E). Common to chassis.	A37	Adjust for maximum deflection.
27.	Turn tuning gang fully closed. Turn tuning core A38 counterclockwise until core is at bottom of pipe, and then 4 turns clockwise.							
28.	270Ω carbon res.	High side thru 270Ω to "FM" antenna terminal. (open link). Low side to chassis.	90MC	FM	Tune for max. deflection	DC Probe to Point (E). Common to chassis.	A39	Adjust for maximum deflection.
29.	"	"	105MC	"	"	"	A38	"

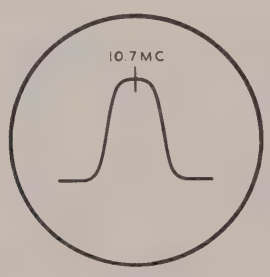


FIG. 8

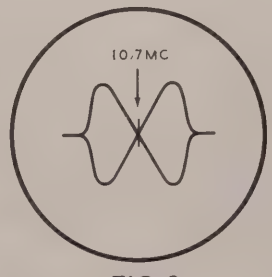


FIG. 9

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	-.5VDC	.7VDC	0V	6.3VAC	200VDC	120VDC	.4VDC		
V 2	12AT7	120VDC	0V	2VDC	6.3VAC	6.3VAC	220VDC	§-5.2VDC	0V	0V
V 3	6AU6	-.6VDC	0V	6.3VAC	0V	115VDC	115VDC	.5VDC		
V 4	6AU6	-.4VDC	0V	6.3VAC	0V	115VDC	115VDC	.6VDC		
V 5	6AG5	0V	.9VDC	6.3VAC	0V	120VDC	120VDC	.9VDC		
V 6		NOT USED IN ALL MODELS								
V 7	6AH6	1VDC	30VDC	6.3VAC	0V	205VDC	150VDC	30VDC		
V 8	6AU6	0V	1.2VDC	6.3VAC	0V	90VDC	90VDC	1.2VDC		
V 9	6AL5	.2VDC	-.2VDC	6.3VAC	0V	.2VDC	0V	.2VDC		
V 10	6J5GT	0V	0V	200VDC	0V	-1.3VDC	0V	6.3VAC	0V	
V 11	6V6GT	0V	6.3VAC	300VDC	140VDC	0V	17VDC	0V	7.4VDC	
V 12	6SN7GT	-3.5VDC	15VDC	0V	8VDC	100VDC	13VDC	0V	6.3VAC	
V 13	6SN7GT	0V	125VDC	5VDC	-3.2VDC	120VDC 55VDC	5VDC	0V	6.3VAC	
V 14	6AS5	40VDC 25VDC	0V	6.3VAC	0V	0V	300VDC	300VDC		
V 15	6AL5	.6VDC	.6VDC	6.3VAC	0V	2.8VDC	0V	-2.8VDC		
V 16	6SN7GT	-4.6VDC	150VDC	7.8VDC	0V	185VDC	7.2VDC	6.3VAC	0V	
V 17	6BQ6GT	150VDC	6.3VAC	0V	145VDC	-18VDC	0V	0V	5.8VDC	TOP CAP *
V 18	6W4GT	0V	0V	380VDC	0V	235VDC	0V	380VDC	380VDC	
V 19	1B3GT	* DO NOT MEASURE								
V 20	5U4G	0V	330VDC	0V	340VAC	0V	340VAC	0V	330VDC	
V 21	16RP4	6.3VAC	0V	PIN 10 320VDC	PIN 115VDC	11 0V	PIN 12 0V			

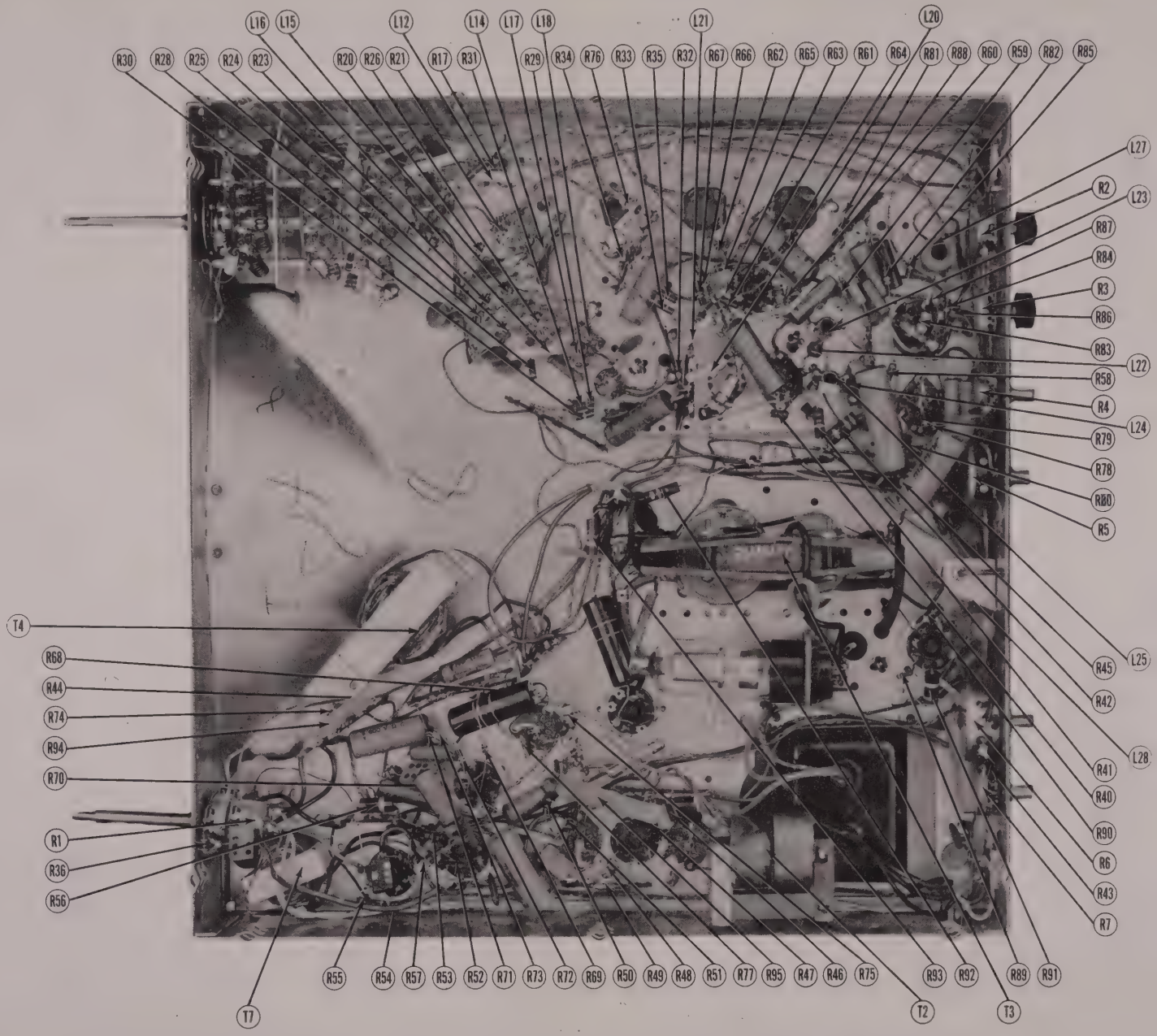
§ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT MEASURE

RESISTANCE READINGS

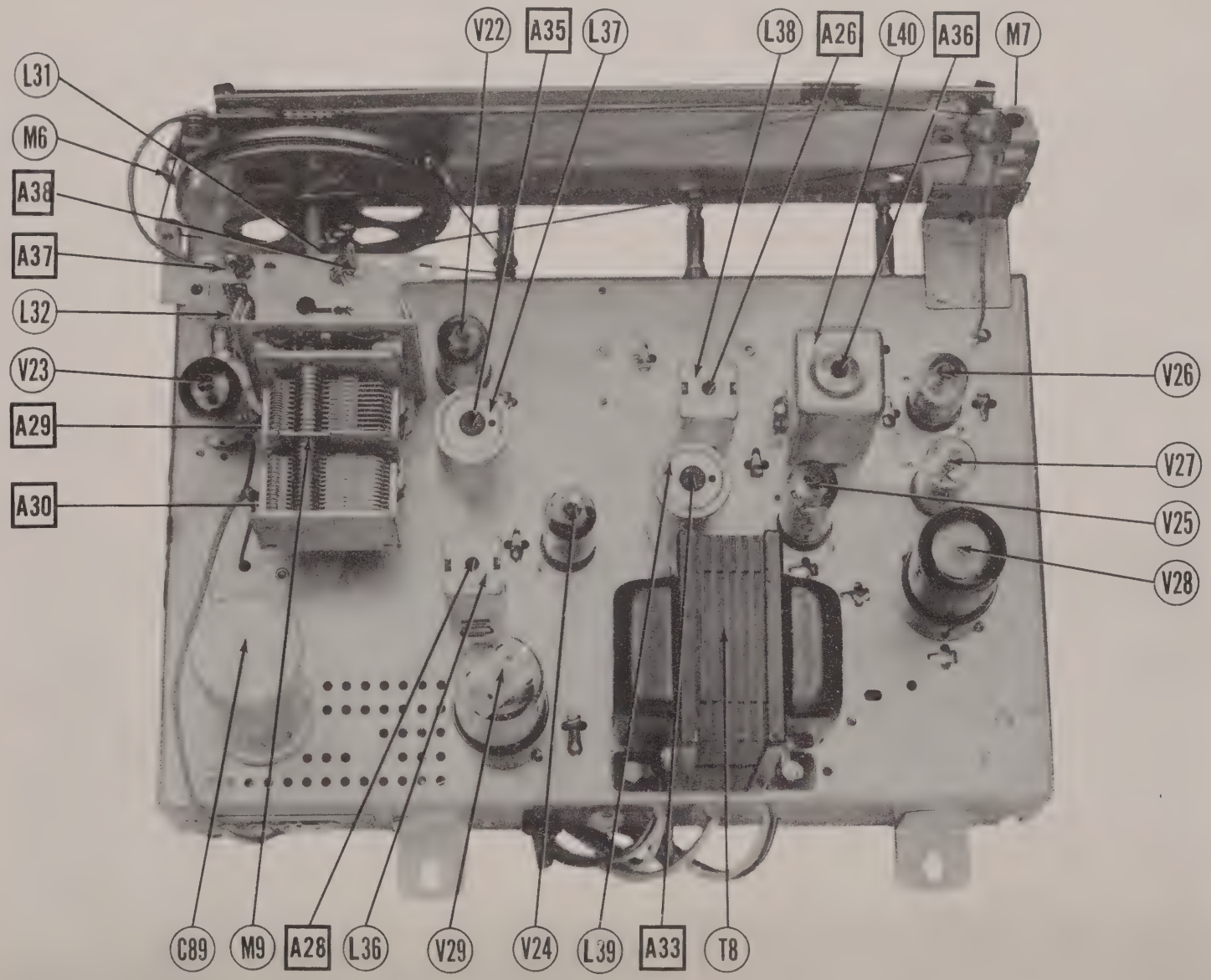
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	1.6 Meg.	80Ω	0Ω	.3Ω	†4.4KΩ	†8.2KΩ	33Ω		
V 2	12AT7	†7.3KΩ	5.6KΩ	1.2KΩ	.3Ω	.3Ω	†2KΩ	10KΩ	1.8Ω	0Ω
V 3	6AU6	1.5 Meg.	0Ω	.1Ω	0Ω	†4.8KΩ	†4.8KΩ	47Ω		
V 4	6AU6	1.5 Meg.	0Ω	.1Ω	0Ω	†4.8KΩ	†4.8KΩ	47Ω		
V 5	6AG5	.5Ω	82Ω	.3Ω	0Ω	†4.1KΩ	†4.1KΩ	82Ω		
V 6		NOT USED IN ALL MODELS								
V 7	6AH6	1 Meg.	2KΩ	.1Ω	0Ω	†5.3KΩ	†33KΩ	2KΩ		
V 8	6AU6	1.3Ω	220Ω	.1Ω	0Ω	†10KΩ	†10KΩ	220Ω		
V 9	6AL5	6.8KΩ	6.8KΩ	.1Ω	0Ω	1 Meg.	0Ω	1 Meg.		
V 10	6J5GT	0Ω	0Ω	†470KΩ	0Ω	4.7 Meg.	0Ω	.1Ω	0Ω	
V 11	6V6GT	0Ω	.1Ω	†1.7KΩ	†2.6KΩ	470KΩ	†470KΩ	0Ω	330Ω	
V 12	6SN7GT	2.2 Meg.	†1 Meg.	0Ω	22KΩ	†13KΩ	3.3KΩ	0Ω	.1Ω	
V 13	6SN7GT	222KΩ	†100KΩ	2.7KΩ	100KΩ 1.1 Meg.	†470KΩ †5.5Meg.	2.7KΩ	0Ω	.1Ω	
V 14	6AS5	2.5KΩ 470Ω	3.3 Meg.	.1Ω	0Ω	3.3 Meg.	†710Ω	†610Ω		
V 15	6AL5	15KΩ	15KΩ	.1Ω	0Ω	4.8 Meg.	0Ω.	4.8 Meg.		
V 16	6SN7GT	120KΩ 220KΩ	†68KΩ	1.5KΩ	9.5 Meg.	†7KΩ	1KΩ	11Ω	0Ω	
V 17	6BQ6GT	†68KΩ	.1Ω	Inf.	†7KΩ	470KΩ	Inf.	0Ω	47Ω	TOP CAP #18Ω
V 18	6W4GT	Inf.	Inf.	Inf.	Inf.	†500Ω	Inf.	#.6Ω	#0Ω	
V 19	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #180Ω
V 20	5U4G	Inf.	50KΩ	Inf.	25Ω	Inf.	25Ω	Inf.	50KΩ	
V 21	16RP4	.1Ω	2.7KΩ	PIN 10 †0Ω	PIN 47KΩ	11 550KΩ	PIN 12 0Ω			

FOCUS CONTROL COUNTERCLOCKWISE
† MEASURED FROM +320VDC POINT
# MEASURED FROM PIN 3 OF V18

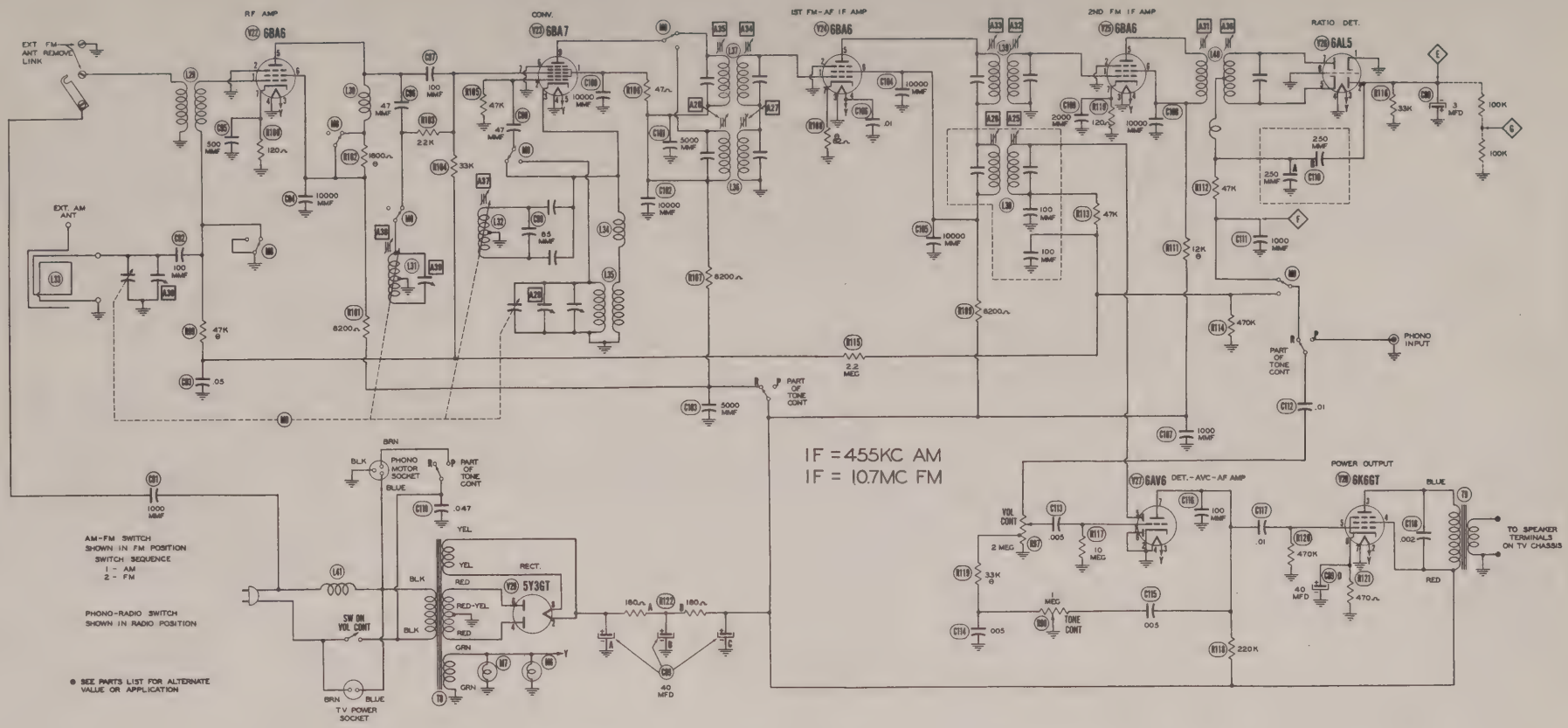
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



RADIO CHASSIS-TOP VIEW



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V22	6BA6	+90V ▲-.2VDC	0V	6.3VAC	0V	†105VDC ▲90VDC	105VDC	1.5VDC		
V23	6BA7	95VDC	95-6.4VDC ▲4-5.8VDC	0V	0V	6.3VAC	0V	+90V ▲-.2VDC	0V	95VDC
V24	6BA6	0V	0V	0V	6.3VAC	95VDC	95VDC	1.2VDC		
V25	6BA6	0V	0V	0V	6.3VAC	85VDC	85VDC	1.2VDC		
V26	6AL5	0V	†-1.4VDC	6.3VAC	0V	†-6VDC	0V	†-6VDC		
V27	6AV6	-.6VDC	0V	6.3VAC	0V	-.7VDC	0V	90VDC		
V28	6K6GT	0V	6.3VAC	140VDC	305VDC	0V	0V	0V	15VDC	
V29	5Y3GT	0V		330VDC	330VAC	0V		330VDC	0V	330VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V22	6BA6	†.2Ω ▲2.7Meg.	0Ω	.1Ω	0Ω	†90.5KΩ ▲110KΩ	90.5KΩ	120Ω		
V23	6BA7	90.5KΩ	47KΩ	.4Ω	0Ω	.1Ω	0Ω	†110KΩ ▲2.7Meg.	0Ω	90.5KΩ
V24	6BA6	1ΩΩ	0Ω	0Ω	.1Ω	90.5KΩ	90.5KΩ	82Ω		
V25	6BA6	.7Ω	0Ω	0Ω	.1Ω	†115KΩ	†115KΩ	120Ω		
V26	6AL5	0Ω	33KΩ	.1Ω	0Ω	Inf.	0Ω	Inf.		
V27	6AV6	10 Meg.	0Ω	.1Ω	0Ω	▲520KΩ	0Ω	†220KΩ		
V28	6K6GT	Inf.	.1Ω	11KΩ	1360Ω	470KΩ	0Ω	0Ω	470Ω	
V29	5Y3GT	Inf.	46KΩ	Inf.	100Ω	Inf.	100Ω	Inf.	46KΩ	

RADIO-PHONO SWITCH IN RADIO POSITION
† TAKEN IN FM POSITION
▲ TAKEN IN AM POSITION

† MEASURED FROM PIN 2 OF V29

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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MOTOROLA MODELS 14K1BH, 14T3, Series 16F1, 16K2, 16T1, 17F1, 2, 3, 4, 5; 17K1, 3, 4; 17T1, 2, 3

RADIO SCHEMATIC

MOTOROLA MODELS 14K1BH, Series 16F1,
16K2, 16T1, 17F1, 2, 3, 4, 5; 17K1, 3, 4; 17T1, 2, 3

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6CB6	6CB6	6CK	
V2	Converter	12AT7	12AT7	9A	
V3A	1st Video IF	6AU6	6AU6	7BK	
B	1st Video IF	6AG5	6AG5	7BD	
V4A	2nd Video IF	6AU6	6AU6	7BK	
B	2nd Video IF	6AG5	6AG5	7BD	
V5	3rd Video IF	6AG5	6AG5	7BD	
V6A	Crystal Det.				Used in model 17F5.
B	Video Det. -AGC	6AL5	6AL5	6BT	
V7A	Video Amp.	6AH6	6AH6	7BK	
B	Video Amp.	6CB6	6CB6	7CM	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Det.	6AL5	6AL5	6BT	
V10	AF Amp.	6J5GT	6J5GT	6Q	
V11	Audio Output	6V6GT	6V6GT	7AC	
V12	Sync. Sep. -Sync. Amp.	6SN7GT	6SN7GT	8BD	
V13A	Vert. Mult.	6SN7GT	6SN7GT	8BD	
B	Vert. Mult.	12AU7	12AU7	9A	
V14A	Vert. Output	6AS5	6AS5	7CV	
B	Vert. Output	6W6GT	6W6GT		
V15A	Hor. Phase Det.	6AL5	6AL5	6BT	
B	Hor. Phase Det.	6H6	6H6	7Q	
V16	Hor. Mult.	6SN7GT	6SN7GT	8BD	
V17	Hor. Output	6BQ6GT	6BQ6GT	6AM	
V18	Damper	6W4GT	6W4GT	4CG	
V19	HV Rect.	1B3GT	1B3GT	3C	
V20	LV Rect.	5U4G	5U4G	5T	
V21A	Picture Tube	16RP4	16RP4	12D	
B	Picture Tube	16TP4	16TP4	12D	Used in chassis TS-89, TS-94, TS-95
C	Picture Tube	16GP4	16GP4	12D	
D	Picture Tube	14BP4	14BP4	12D	
E	Picture Tube	14CP4	14CP4	12D	Used in chassis TS-114, TS-115
F	Picture Tube	14RP4	14RP4	12D	
G	Picture Tube	17AP4	17AP4	12D	
H	Picture Tube	17BP4	17BP4	12D	Used in chassis TS-118

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	80	400	23B700613	AFH16I42G		UPT840-2130			▲ Filter ■ Decoupling ▲ V. Amp. Screen
B	20	300							
C	10	300							
C2A	60	400	23B700614	AFH12I8G4A		UPT640-430C			▲ Filter ■ Filter ▲ Output Cathode
B	40	300							
C	20	25							
C3A	35	400	23B700615	AFH7I20B		UPT2150V10			■ Filter ▲ Vert. Output Cath.
B	100	50							
C4A	80	400	23B700160	AFH16I842G		UPT840-2130			▲ Filter
B	40	300				BR4035A			■ Filter
C	20	300							▲ Decoupling
D	10	300							V. Amp. Screen
C5A	80	400	23B700159	AFH168I20B4A		UPT8440V15			▲ Filter
B	40	400				BR202A			■ Filter
C	100	50							▲ Vert. Output Cath.
D	20	25							Output Cathode
C6	10	50	23A90205	PRS50/10		BR105		TVA-1304	Stabilizing Cap.
C7	220		21K77375	SI220	D6-221		GP2K-220	19C13	RF Coupling
C8	8		21K478234	SI8.2NPO			NPOK-8.2		Fixed Trimmer
C9	5000		21A470789	BPD-005	DD-502		811-005	29C1	AGC Filter
C10	10000		21K482726	BPD-01	DD-103		811-01	36C1	RF Amp. Plate Dec.
C11	10000		21K482726	BPD-01	DD-103		811-01	36C1	RF Amp. Plate Dec.
C12	10000		21K482726	BPD-01	DD-103		811-01	36C1	RF Amp. Screen
C13	1500		21A470790	BPD-0015	DD-152		811-0015	29C8	RF Amp. Screen
C14	1500		21A470790	BPD-0015	DD-152		811-0015	29C8	RF Amp. Cath.
C15	20		21K470322	SI20	D6-200		GP1K-20	19C23	RF Amp. Cath.
C16	220		21K77375	SI220	D6-221		GP2K-220	19C13	RF Amp. Fil.
C17	.5-3		1X790189		829-3				Variable Trimmer
C18	8		21K478234	SI8.2NPO			NPOK-8.2		RF Coupling
C19	5000		21A470789	BPD-005	DD-502		811-005	29C1	Decoupling
C20	5000		21A470789	BPD-005	DD-502		811-005	29C1	Conv. Cathode
C21	220		21K77375	SI220	D6-221		GP2K-220	19C13	Conv. Filament
C22	2		21K478280		TCZ-2.2				Osc. Coupling
C23	10		21K400173	SI10	D6-100		GP1K-10	19C19	Osc. Grid Cap.
C24	.5-3		1X790189		829-3				Variable Trimmer
C25	2		21K478280		TCZ-2.2				Osc. Feedback
C26	5000		21A470789	BPD-005	DD-502		811-005	29C1	Osc. Plate Byp.
C27	1500		21A470790	BPD-0015	DD-152	1W5D15	811-0015	29C8	AGC Filter
C28	5000		21A47789	BPD-005	DD-502	1D5D5	811-005	29C1	1st V. IF Dec.
C29	5000		21A47789	BPD-005	DD-502	1D5D5	811-005	29C1	1st V. IF Cath. *
C30	220		21K77375	SI220	D6-221	5W5T25	GP2K-220	19C13	IF Coupling
C31	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	29C1	AGC Filter
C32	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	29C1	2nd V. IF Dec.
C33	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	29C1	2nd V. IF Cath. *
C34	220		21K77375	SI220	D6-221	5W5T25	GP2K-220	19C13	IF Coupling
C35	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	29C1	3rd V. IF Dec.
C36	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	29C1	3rd V. IF Cath.
C37	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	29C1	3rd V. IF Fil.
C38	.25	100	8R9810	P488-25		GT2P25		2TM-P25	AGC Filter
C39	30		21K470329				N150K-30		Fixed Trimmer
C40	30		21K470329				N150K-30		Fixed Trimmer
C41	6		21K470324	SI6.8NPO	TCZ-6.8	5W5V5	NPOK-6.8	MS-55	V. Diode Filter
C42	.1	200	8R9854	P288-1	DF-104	PTE4P1		2TM-P1	RF Bypass *
C43	.1	200	8R9854	P288-1	DF-104	PTE4P1		2TM-P1	Video Coupling
C44	1000		21K780599	SI1000	D6-102	1W5D1	GP2L-001	19C1	V. Amp. Cathode-*

TV PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C45	1000		21K780599	SI1000	D6-102	1W5D1	GP2L-001	19C1	See Note 1 V. Amp. Cathode-*
C46	100		21B77286	SI100	D6-101	5W5T1	GP1K-100	19C11	See Note 1 V. Amp. Cathode-*
C47	30		21K470329				N150K-30		Fixed Trimmer
C48	.1	600	8R9874	P688-1	DF-104	PTE6P1		6TM-P1	Video Coupling
C49	2.2		21A478274		TCZ-2.2				S. IF Coupling
C50	60		21K790683		TCN-62		N750K-60		Fixed Trimmer
C51	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	29C1	S. IF Decoupling
C52	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	29C1	S. IF Cath.
C53	500	500	21R6590	1468-0005	D6-501	5W5T5	GP2K-500	1FM-35	Diode Load Cap.
C54	.001	600	8R9866	P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	De-emphasis
C55	500	500	21R6590	1468-0005	D6-501	5W5T5	GP2K-500	1FM-35	RF Bypass
C56	10000		21K482726	BPD-01	DD-103	PTE4S1	811-01	36C1	Audio Coupling
C57	.005	600	8R9869	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling #
C58	68	500	21R6650	SI68	D6-680	5W5Q7	GP1K-68	19C10	AF Feedback
C59	.005	600	8R9869	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Sync. Coupling
C60	20		21K470322	SI20	TCZ-20	5W5Q2	GP1K-20	19C23	Sync. Sep. Grid
C61	.05	600	8R9873	P688-05	DF-503	PTE6S5		6TM-S5	Sync. Coupling
C62	.005	600	8R9869	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Vert. Sync. Coupling-See Note 2
C63	.005	600	8R9869	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Integrator Net. -See Note 2
C64	.01	600	8R9870	P688-01	D6-103	PTE6S1	811-01	6TM-S1	Integrator Net. -See Note 2
C65	.01	600	8R9870	P688-01	D6-103	PTE6S1	811-01	6TM-S1	Vert. MV Feedback
C66	.02	200	8R9851	P488-02	DF-203	PTE4S2		2TM-S2	Vert. MV Cath.
C67	500	500	21R6590	1468-0005	D6-501	5W5T5	GP2K-500	1FM-35	Vert. MV Grid
C68	.001	600	8R9866	P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	Vert. Discharge
C69	.05	600	8R9873	P688-05		PTE6S5		6TM-S5	Vert. Discharge
C70	.15	400	8R9875	P488-15		GT4P2		4TM-P15	Vert. Sweep Coupling
C71	.001	600	8R9866	P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	Hor. Sync. Coupling
C72	.001	600	8R9866	P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	Hor. Sync. Coupling
C73	.0047	600	8R9869	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Voltage Divider
C74	.001	600	8R9866	P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	AFC Filter
C75	.01	600	8R9870	P688-01	D6-103	PTE6S1	811-01	6TM-S1	AFC Filter
C76	.005	600	8R9869	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Fixed Trimmer
C77	270		21K400037	SI270	D6-271	5W5T25	GP2K-270	19C31	Hor. MV Feedback
C78	680	500	21R2741	SI680	D6-681	1W5T7	GP2K-680	1FM-37	Hor. Discharge
C79	.005	600	8R9869	P688-005	D6-502	PTE6D5		6TM-D5	Hor. Sweep Coupling
C80	.1	600	8R9874	P688-1	DF-104	PTE6P1		6TM-P1	Hor. Output Screen
C81	.1	200	8R9854	P288-1	DF-104	PTE4P1		2TM-P1	Hor. Output Cath.
C82	180	3000	21K700883						Damper Plate Byp. †
C83	.1	600	8R9874	P688-1	DF-104	PTE6P1		6TM-P1	Damper Filter
C84	.1	600	8R490261	P688-1	DF-104	PTE6P1		6TM-P1	Hor. Sweep Coupling
C85	500	20000	21A790833		TV3-502				HV Filter ‡
C86	10000		21K482726	BPD-01	DD-103	PTE6S1	811-01	36C1	Line Filter *
C87	10000		21K482726	BPD-01	DD-103	PTE6S1	811-01	36C1	Line Filter *
C88	100	500	21R6554	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Sync. Coupling *

* Not used in all models.
† Chassis TS-94 and TS-95 use 150MMF in this application, Mfgr's part No. 21K700620.
‡ Used only in chassis TS-94 and TS-95.
# Some models have C57, R53, and R54 combined into one unit obtainable under Mfgr's part No. 21B702478.
Note 1. Some models have C44, C45, R37 and R38 combined into one unit obtainable under Mfgr's part No. 21B702479.
Note 2. Some models have C62, C63, C64, R67, R68 and R69 combined into one unit obtainable under Mfgr's part No. 21B702636.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	2000Ω	½	18A791705 *				Contrast control-front-tapped at 1500 and 1750
B	1 Meg.						Volume control and switch-rear
R2A	100KΩ	½	18A791574	Q11-128	AG-49-S	B-40	Horiz. hold control
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Attach to R2A per instructions
R3A	1 Meg.	½	18A90147	Q11-137	AG-61-S	B-69	Vert. hold control
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Attach to R3A per instructions
R4A	5 Meg.	½	18A90145	Q11-141	AG-85-S	B-87	Vert. size control
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Attach to R4A per instructions
R5	2000Ω	2	18A790146	W-2000	43-2000	VK-131	Vert. linearity control-Wire Wound
R6	1000Ω	4	18K700165 †			SVP-993	Focus control-Wire Wound
R7A	1 Meg.	½	18A90147	Q11-137	AG-61-S	B-69	Brightness control
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Attach to R7A per instructions

* Models TS-95, TS-114, and TS-115 use part number 18A792009.
† Models TS-114 uand TS-115 use part number 18K701114.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R8	22KΩ	½	6R6397		RF Amp. Grid
R9	47KΩ	½	6R6048	BTS-47K	AGC Filter Network
R10	47Ω	½	6R5550		RF Amp. Cathode-See Note 1
R11	33Ω	½	6R2036		RF Amp. Cathode
R12	1000Ω	½	6R6229	BTS-1000	RF Amp. Screen
R13	3900Ω	½	6R5659	BTS-3900	RF Amp. Plate Decoupling
R14	3900Ω	½	6R5659	BTS-3900	Osc. Coil Shunt-See Note 2
R15	10KΩ	½	6R6320		Osc. Grid
R16	1800Ω	½	6R6038	BTS-1800	Osc. Plate-See Note 8
R17	5600Ω	½	6R6117		Mixer Grid
R18	1200Ω	½	6R6393	BTS-1200	Mixer Cathode
R19	4700Ω	½	6R5671	BTS-4700	Decoupling Video
R20	6800Ω	½	6R6428		1st Video IF Transformer Shunt
R21	47Ω	½	6R5550		1st Video IF Amp. Cathode
R22	33Ω	½	6R2036		1st Video IF Amp. Cathode-See Note 6
R23	2200Ω	½	6R6069	BTS-2200	1st Video IF Amp. Decoupling
R24	12KΩ	½	6R6394		2nd Video IF Transformer Shunt
R25	1000Ω	½	6R6229	BTS-1000	AGC Filter Network
R26	47Ω	½	6R5550		2nd Video IF Amp. Cathode
R27	33Ω	½	6R2036		2nd Video IF Amp. Cathode-See Note 6
R28	2200Ω	½	6R6069	BTS-2200	2nd Video IF Amp. Decoupling

TV PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA IRC PART No.	IDENTIFICATION CODES
R29	6800Ω	½	6R6428		3rd Video IF Transformer Shunt
R30	82Ω	½	6R2035	BTS-82	3rd Video IF Amp. Cathode
R31	1500Ω 20%	½	6R6038	BTS-1500	3rd Video IF Amp. Decoupling
R32	5600Ω	½	6R6117	BTS-5600	Video Det. Diode Load
R33	1.5 Meg.	½	6R6460	BTS-1.5 Meg.	AGC Network
R34	100KΩ	½	6R6031	BTS-100K	Series Test Socket
R35	100KΩ	½	6R6031	BTS-100K	Series Test Socket
R36	47Ω	½	6R5550	BW-½-47	Contrast Control Shunt
R37	120Ω	½	6R5551	BTS-120	Video Compensation-See Notes 6 and 9
R38	120Ω	½	6R5551	BTS-120	Video Compensation-See Notes 6 and 9
R39	1500Ω	½	6R6038	BTS-1500	Video Compensation-See Note 6
R40	1 Meg.	½	6R6004	BTS-1 Meg.	Video Compensation Grid
R41	33KΩ	1	6R6400	BTA-33K	Video Compensation Screen-See Note 3
R42	4700Ω	2	6R5671	BTB-4700	Video Compensation Plate
R43	1 Meg. 20%	½	6R6004	BTS-1 Meg.	Voltage Divider
R44	2700Ω	½	6R5577	BTS-2700	Picture Tube Grid
R45	47KΩ	½	6R6048	BTS-47K	Picture Tube Cathode
R46	220Ω 20%	½	6R6270	BTS-220	Sound IF Amp. Cathode
R47	8200Ω	½	6R2004		Sound IF Amp. Decoupling
R48	180Ω	½	6R5660	BTS-180	Balancing
R49	33KΩ	½	6R6410	BTS-33K	De-emphasis
R50	6800Ω	½	6R6428	BTS-6800	Ratio Det. Diode Load
R51	6800Ω	½	6R6428	BTS-6800	Ratio Det. Diode Load
R52	4.7 Meg.	½	6R6446	BTS-4.7 Meg.	AF Amp. Grid
R53	470KΩ	½	6R6377	BTS-470K	AF Amp. Plate #
R54	470KΩ	½	6R6377	BTS-470K	Output Grid #
R55	330Ω	½	6R6023	BTS-330	Output Cathode
R56	1000Ω	3	6R3923	BTB-1000	Decoupling
R57	270KΩ	½	6R6414	BTS-270K	Feedback
R58	10KΩ	½	6R6320	BTS-10K	Isolation
R59	470KΩ	½	6R6377	BTS-470K	Isolation-See Note 6
R60	2.2 Meg. 20%	½		BTS-2.2 Meg.	1st Sync. Clipper Grid-See Note 7
R61	1 Meg. 20%	½	6R6004	BTS-1 Meg.	1st Sync. Clipper Plate
R62	22KΩ	½	6R6397	BTS-22K	2nd Sync. Clipper Grid
R63	330KΩ	½	6R2096	BTS-330K	Voltage Divider
R64	3300Ω	½	6R5581	BTS-3300	2nd Sync. Clipper Cathode
R65	6800Ω	½	6R6428	BTS-6800	2nd Sync. Clipper Plate
R66	3300Ω	½	6R5581	BTS-3300	Voltage Divider
R67	100KΩ	½	6R6031	BTS-100K	Voltage Divider-See Note 10
R68	100KΩ	½	6R6031	BTS-100K	Integrator-See Note 10
R69	22KΩ	½	6R6397	BTS-22K	Integrator-See Note 10
R70	2700Ω	½	6R5577	BTS-2700	Vert. MV Cathode
R71	100KΩ	½	6R6031	BTS-100K	Vert. MV Grid-See Note 4
R72	100KΩ	½	6R6031	BTS-100K	Vert. MV Plate
R73	470KΩ	½	6R6377	BTS-470K	Vert. MV Plate
R74	6800Ω	½	6R6428	BTS-6800	Vert. Peaking
R75	3.3 Meg.	½	6R6497	BTS-3.3 Meg.	Vert. Output Grid
R76	470Ω	½	6R6090	BTS-470	Vert. Output Cathode
R77	1000Ω 20%	½	6R6018		Parasitic Supp.-See Note 6
R78	15KΩ	½	6R6477	BTS-15K	Horiz. Phase Det. Diode Load
R79	100KΩ	½	6R6031	BTS-100K	Horiz. Phase Det. Diode Load
R80	100KΩ	½	6R6031	BTS-100K	Horiz. Phase Det. Diode Load
R81	4.7 Meg.	½	6R6446	BTS-4.7 Meg.	Horiz. AFC Filter
R82	4.7 Meg. 20%	½	6R6446	BTS-4.7 Meg.	Horiz. MV Grid
R83	470Ω	½	6R6090	BTS-470	Horiz. MV Cathode
R84	1000Ω	½	6R6229	BTS-1000	Horiz. MV Cathode
R85	6800Ω	½	6R6428	BTS-6800	Horiz. MV Plate
R86	120KΩ	½	6R5631	BTS-120K	Horiz. MV Grid
R87	68KΩ	½	6R6074	BTS-68K	Horiz. MV Plate
R88	1500Ω	½	6R6038	BTS-1500	Horiz. Peaking
R89	470KΩ	½	6R6377	BTS-470K	Horiz. Output Grid
R90	47Ω	1	6R5583	BW-1-47	Horiz. Output Cathode
R91	6800Ω	2	6R5690	BTB-6800	Horiz. Output Plate
R92	150KΩ	1	6R5721	BTA-150K	Horiz. Feedback
R93	150KΩ	1	6R5721	BTA-150K	Horiz. Feedback
R94	375Ω	10	17K700782		Focus Coil Shunt-Wire Wound-See Note 5
R95	2000Ω	10	17K792705	1 3/4A-2000	Flter-Wire Wound
R96	1500Ω	½	6R6038	BTS-1500	Voltage Divider-See Note 6

Note 1. Some models use 56Ω resistor in this application.
Note 2. Some models use 2200Ω resistor in this application.
Note 3. Some models use 22KΩ resistor in this application.
Note 4. Some models use 330KΩ resistor in this application.
Note 5. Chassis TS-114 and TS-115 use 1000Ω resistor in this application.
Note 6. Not used in all models.
Note 7. When R59 is used R60 is 2.2 Meg., when R59 is not used R60 is 1 Meg.
Note 8. Some models use 1500Ω resistor in this application.
Note 9. Some models have C44, C45, R37, and R38 combined into one unit obtainable under Mfgr's part No. 21B702479.
Note 10. Some models have C62, C63, C64, R67, R68, and R69 combined into one unit obtainable under Mfgr's part No. 21B702636.
Some models have C57, R53 and R54 combined into one unit obtainable under Mfgr's part No. 21B702478.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.
T1	117VAC ② 1.8A	620VCT .240ADC	5VCT ② 3A	6.3VAC ② 7.6A	25K700882 25C701025 ① 25C700869 ① 25C700161 ①			

① Alternate part number.

TRANSFORMER (FILAMENT)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.
T2	117VAC ② .10BA	6.3VAC ② 1.2A			25B790140	P-6134 ②	P-2944 ②	F-633 ②

② Drill one new mounting hole.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING PRI.	RATING SEC.	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	NOTES
T3	210Ω	0Ω	24K792753 ③				Hor. Output Trans.
	Tap ④ 2.3Ω, 21.5Ω, 39Ω		24K701099① ③				Hor. Output Trans.
T3			24C701134 ④				Hor. Output Trans.
T4	600Ω	11.5Ω	25B792168⑤ ②	A-8113 ②	A-3038 ②	T80-5 ②	Vert. Output Trans.
			25K701619 ①				Vert. Output Trans.
T4			25K701143 ④				Vert. Output Trans.
T5A	37Ω		25K700694 ⑤		MD70F		Hor. Deflection Coil
B	62Ω		24C792171				Vert. Deflection Coil
			24K700714				
			24K700778				
			24K700776				
			24K700774				
			24C700050				
			24K792173				
			24C792508				Alternate Deflection Yokes
			24K792508				
			24K701139				
			24K701136				
			24K701141				
			24K701138				
			24K701142				
			24K702039				
T5			24B700548 ③				Focus Coil
T6			24K701512 ④				Focus Coil

① Alternate part number.
② Drill one new mounting hole.
③ Used in chassis TS-89, TS-94, TS-95 and TS-118.
④ Used in chassis TS-114 and TS-115.
⑤ Used in chassis TS-89.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	INSTALLATION NOTES
T7	4500Ω	3.6Ω	300Ω	.4Ω	25B790686	A-3877	A-2930	RO-8	

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA JENSEN PART No.	REPLACEMENT DATA QUAM PART No.	INSTALLATION NOTES
SP1A	PM	3.2Ω	50C701328 ⑨	ST-120 ⑧		
AA	PM	3.2Ω	50C701634 or 50C702057 ⑩	MOD. P10-5	10A4A	⑧ Replace output transformer to match 6-8Ω voice coil. Remove cover if necessary. ⑨ Used in models 17F2, 17F2WA, 17F3, 17F3BA, 17F4, 17F4A, 17F5, 17F5A, 17F5BA
B	PM	3.2Ω	50C701501 ⑪			⑩ Alternate speakers for models 17F2, 17F3, 17F4, 17F5
BA	PM	3.2Ω	50C701633 or 50C701631 ⑫			⑪ Used in models 17F1, 17F1A, 17F1BA
C	100Ω	3.2Ω	50C700850 ⑬			⑫ Alternate speakers for model 17F1.
D	100Ω	3.2Ω	50C489002 ⑭			⑬ Used in models 16K2BH, 16K2H, 17K1A, 17K1BA, 17K3, 17K3A, 17K3BA, 17K4A.
DA	100Ω	3.2Ω	50C701615 ⑮			⑭ Used in models 17T1, 17T1A, 17T1BA, 17T2, 17T2A, 17T2BA, 17T3, 17T3A.
E	PM	3.2Ω	50C791427 ⑯			⑮ Alternate speaker for models 17T1, 17T2, 17T3.
F	100Ω	3.2Ω	50K700729 ⑰			⑯ Used in models 16F1BH, 16F1H.
G	100Ω	3.2Ω	50C701808 ⑳			⑰ Used in models 16T1BH, 16T1H.
H	100Ω	3.2Ω	50C791913 ㉑			⑳ Used in models 14K1, 14T3.
	CONE DIA.	V. C. DIA.				㉑ Used in models 14K1BH, 14K1H.
SP2A	10"	1"				
AA	10"					
B	6" x 9"					
BA	6" x 9"					
C	8"					
D	6"					
DA	6"					
E	10"					
F	8"					
G	5"					
H	8"					

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	INSTALLATION NOTES
L2	.240ADC	55Ω		25B701075	C-2326 ⑱	C-3994		⑱ Drill new mounting hole. Used only in models employing PM speaker.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA MEISSNER PART No.	REPLACEMENT DATA IRC PART No.	NOTES
L2	Ant. Matching Coil	0Ω		24A790033			
L3	Ant. Coil	0Ω		24K792765			Channels 2 to 6
L4	Ant. Coils	0Ω		24C792764			Channels 2 to 6
L5	RF Coils0	0Ω		24K790536			Channel 13 chassis TS-89, -94, -95, -115, -118.
L6A	RF Coil	0Ω		24K792825			
B	RF Coil	0Ω		24K701839			Channel 13, chassis TS-114

COILS (RF-IF) CONT.

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA MEISSNER PART No.	REPLACEMENT DATA IRC PART No.	NOTES
L7	Grid Choke	3.3Ω		24K792577		CL-1	3.3 microhenries
L8	Osc. Coils	0Ω		24C700114			Channels 2 to 6
L9	Osc. Coil	0Ω		24K700115			Channel 10
L10	Osc. Coil	0Ω		24K700116			Channel 13
L11	Cath. Chk.	1.8Ω		24K780128		CL-1	2.2 microhenries
L12	Fil. Choke	.2Ω		24K790145		CLA	.47 microhenries
L13A	1st Video IF	.5Ω	.3Ω	24K792578			Chassis TS-89, -94, -95, -115, -118
B	1st Video IF			24K701135			Chassis TS-114
L14	RF Choke	3.3Ω		24K790035		CL-1	5.6 microhenries
L15A	2nd Video IF	.4Ω		24B792586			Includes trap, chassis with 6AU6 IF
B	2nd Video IF			24B701343			Includes trap, chassis with 6AU6 IF
C	2nd Video IF			24K702495			Includes trap, chassis with 6AG5 IF
L16	RF Choke	3.8Ω		24K790035		CL-1	5.6 microhenries
L17A	3rd Video IF	.5Ω		24K792587			Includes trap, chassis with 6AU6 IF
B	3rd Video IF			24K701344			Includes trap, chassis with 6AU6 IF
C	3rd Video IF			24K702496			Includes trap, chassis with 6AG5 IF
L18	Fil. Choke	.2Ω		24K790145		CLA	
L19	4th Video IF	.6Ω	.8Ω	24B792585			
L20	Peaking	5.5Ω		24K792771			Yellow dot.
L21A	Peaking	5.8Ω		24K792772 *			Red dot, chassis TS-89, -94, -95
B	Peaking	5.5Ω		24K792771 *			Yellow dot, chassis TS-114, -115
L22A	Peaking	10Ω		24A790579			Wound on 18KΩ resistor, chassis TS-89, -94, -95.
B	Peaking			24K701652			Wound on 12KΩ resistor, chassis TS-114, -115, -118
L23	4.5MC Trap	2.5Ω		24B792735			
L24A	Peaking	9.8Ω		24A792585			Wound on 2.7KΩ resistor, chassis TS-89, -94, -95
B	Peaking			24K701651			Wound on 2.7KΩ resistor, chassis TS-114, -115, -118
L25	Sound IF	1.3Ω		24A470159			
L26	Ratio Det. Trans.	2.8Ω	.4Ω	24B790125			
L27	Horiz. Freq.	150Ω		24K790059			
L28A	Horiz. Size	1.8Ω		24K700069			Chassis TS-89, -94, -95, -115, -118
B	Horiz. Size			24K701349			Chassis TS-114

* Both units used in chassis TS-118

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M1A	RF Tuner	1X700132	Chassis TS-89 and TS-94
B	RF Tuner	1X700100	Chassis TS-95, TS-115
C	RF Tuner	1X701444	Chassis TS-114
M2	Fuse	65A700851	.25A 250V Type 3AG
M3	Crystal		Video Det. 1N60
M4A	Ion Trap	24A792821	Chassis TS-89, -94 and TS-95
B	Ion Trap	24A792827	Chassis TS-89, TS-94, and TS-95
C	Ion Trap	24K700585	Chassis TS-114 and TS-115
D	Ion Trap	24K700586	Chassis TS-114 and TS-115
E	Ion Trap	24K700587	Chassis TS-114 and TS-115
	Safety Glass	61C790865	16 inch, models 16K2H, 16K2BH, 17K1A, 17K1BA, 17K4A
	Safety Glass	61C792189	16 inch, models 16F1H, 16T1H, 16T1BH, 16F1BH
	Safety Glass	61K700607	Rectangular, models 17T1A, 17T1BA, 17T2A, 17T2BA, 17F1A, 17K3BA, 17F1BA, 17F2WA, 17F3BA, 17F4A, 17F5A, 17F5BA, 17K3A, 17T3A
	Safety Glass	61C700134	Rectangular models 14K1H, 14K1BH
	Safety Glass	61C701152	Rectangular model 14T3
	Knob	36B790506	Channel selector, models 16F1H, 16F1BH, 16T1H, 16T1BH, 14K1H, 14K1BH, 16K2H, 16K2BH, 17K1A, 17K1BA, 17T1A, 17T1BA, 17T2A, 17T2BA, 17K4A
	Knob	36C700889	Channel selector, models 17F1A, 17F1BA, 17F5A, 17F5BA
	Knob	36C700733	Channel selector, model 14T3
	Knob	36C700886	Channel selector, models 17F2WA, 17F4A, 17T3A
	Knob	36K701088	Channel selector, model 17F3BA
	Knob	36K700887	Channel selector, model 717K3A, 17K3BA
	Knob	36C700888	Fine Tuning and Volume models 17T3A, 17F2WA, 17F4A, 17K3A, 17K3BA
	Knob	36C700891	Fine tuning and Volume, Models 17F1A, 17F1BA, 17F5A, 17F5BA
	Knob	36C700894	Fine tuning and Volume, model17F3BA
	Knob	36K792078	Fine tuning and volume, models 17K4A, 17K1A, 17T1A, 17T2A, 16F1H, 16T1H, 16K2H, 14K1H
	Knob	36K792079	Fine tuning and volume, models 14K1BH, 16F1BH, 16T1BH, 16K2BH, 17K1BA, 17T1BA, 17T2BA
	Knob	36C700732	Fine tuning and volume, model 14T3
	Knob	36B790505	Contrast, models 16F1H, 16F1BH, 16T1H, 16T1BH, 16K2H, 16K2BH, 17K1A, 17K1BA, 17T1A, 17T1BA, 17T2A, 17T2BA, 17K4A, 14K1H, 14K1BH,
	Knob	36K700890	Contrast, models 17F1A, 17F1BA, 17F5A, 17F5BA
	Knob	36K700887	Contrast, models 17F2WA, 17F4A, 17T3A
	Knob	36C700886	Contrast, models 17K3A, 17K3BA
	Knob	36K701087	Contrast, model 17F3BA
	Knob	36K700734	Contrast, model 14T3
	Knob	36A485457	Vert. and Horiz. hold, models 16F1H, 16F1BH, 16T1H, 16T1BH, 16K2H, 16K2BH, 17T1A, 17T1BA, 17F5A, 17F5BA, 17K3A, 17K3BA, 17K4A, 14K1H, 14K1BH
	Knob	36C701150	Radio controls, models 17F1A, 17F1BA, 17F2WA, 17F3BA, 17F4A, 17F5A, 17F5BA
	Knob	36K792562	Radio controls, model 16F1H
	Knob	36K792561	Radio controls, model 16F1BH
	Glass	34C600811	Radio dial chassis RS-253
	Glass	34C600868	Radio dial chassis RS-261

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA MOTOROLA PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	REMARKS
M5	59K691907	AC-AG-J	A-AG	W26B	A66U	

ASTATIC AND SHURE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

RADIO PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V22	RF Amp.	6BA6	6BA6	7BK	Used in radio chassis HS-253, HS-261
V23	Converter	6BA7	6BA7	8CT	
V24	1st IF-AM IF	6BA6	6BA6	7BK	
V25	2nd FM-IF Amp.	6BA6	6BA6	7BK	
V26	Ratio Det.	6AL5	6AL5	6BT	
V27	DET.-AVC-AF	6AV6	6AV6	7BT	
V28	Power Output	6K6GT	6K6GT	7S	
V29	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C89A	40	300	23B690975	AFH888G4D		UPT44435			▲ Filter
B	40	250		PRS25/25		C5			■ Filter
C	40	250							▲ Filter
D	40	25							Output Cathode
C90	3	50	23K690543	PRS150/4		BBR4-50T		TVA-1402	Stabilizing Cap.
C91	1000		21K478410	SI1000	D6-102	1W5D1	GP2L-001	19C1	Line Ant. Coupling
C92	100		21B77286	SI100	D6-101	5W5T1	GP1K-100	19C11	RF Coupling
C93	.05	400	8R9816	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C94	10000		21K482726	BPD-01	DD-103	PTE4S1	811-01	36C1	RF Amp. Dec.
C95	500		21K481377	SI500	D6-501	5W5T5	GP2K-500	19C32	RF Amp. Cath.
C96	47		21K77373	SI47	D6-470	5W5Q5	GP1K-47	19C25	RF Coupling
C97	100		21B77286	SI100	D6-101	5W5T1	GP1K-100	19C11	RF Coupling
C98	47		21K77373	SI47	D6-470	5W5Q5	GP1K-47	19C25	Osc. Grid Cap.
C99	85		21A690688				N150K-85		Fixed Trimmer
C100	10000		21K482726	BPD-01	DD-103	PTE4S1	811-01	36C1	Osc. Anode Bypass
C101	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	29C1	Conv. Decoupling
C102	10000		21K482726	BPD-01	DD-103	PTE4S1	811-01	36C1	Conv. Decoupling
C103	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C104	10000		21K482726	BPD-01	DD-103	PTE4S1	811-01	36C1	1st IF Decoupling
C105	10000		21K482726	BPD-01	DD-103	PTE4S1	811-01	36C1	1st IF Decoupling
C106	.01	400	8R9809	P488-01	D6-103	PTE4S1	811-01	4TM-S1	1st IF Filament
C107	1000		21K478410	SI1000	D6-102	1W5D1	GP2L-001	19C1	RF Bypass
C108	10000		21K482726	BPD-01	DD-103	PTE4S1	811-01	36C1	2nd IF Decoupling
C109	2000		21K790912	SI2000	D6-202	1W5D2	GP2M-002	29C2	2nd IF Cathode
C110A	250		21B484337	SI250	D6-251	5W5T25	GP2K-250	19C13	Diode Load Cap. *
B	250			SI250	D6-251	5W5T25	GP2K-250	19C13	Diode Load Cap. *
C111	1000		21K478410	SI1000	D6-102	1W5D1	GP2L-001	19C1	De-emphasis
C112	.01	400	8R9809	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Audio Coupling
C113	.005	600	8R9813	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling
C114	.005	600	8R9813	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Tone Comp.
C115	.005	600	8R9813	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Tone Comp.
C116	100		21B77286	SI100	D6-101	5W5T1	GP1K-100	19C11	AF Amp. Plate
C117	.01	400	8R9809	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Audio Coupling
C118	.002	600	8R9847	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	Output Plate Bypass
C119	.047	400	8R490232	P488-047	DF-503	PTE4S5		4TM-S47	Line Filter

* When either items C110A or C110B are replaced, replace by capacitors of equal value.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R97A	2 Meg.	½	18A600974	Q13-139X			Volume control tapped at 600KΩ
B	Switch		Not Req.	76-1			Attach to R97A per instructions
R98	1 Meg.	½	18B600683				Tone control with radio-phono switch

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	IDENTIFICATION CODES
R99	47KΩ	½	6R6056	BTS-47K	AVC Network-See Note 1
R100	120Ω	½	6R5551	BTS-120	RF Amp. Cathode
R101	8200Ω	2	6R5725	BTB-8200	RF Amp. Decoupling
R102	1800Ω	½	6R2089	BTS-1800	RF Amp. Plate-See Note 5
R103	22KΩ	½	6R6028	BTS-22K	Converter Grid
R104	33KΩ	½	6R6410	BTS-33K	AVC Network
R105	47KΩ	½	6R6056	BTS-47K	Osc. Grid
R106	47Ω	½	6R2108		Parasitic Suppressor
R107	8200Ω	2	6R5725	BTB-8200	Decoupling
R108	82Ω	½		BTS-82	1st IF Amp. Cathode-See Note 2
R109	8200Ω	2	6R5725	BTB-8200	1st IF Amp. Decoupling
R110	120Ω	½	6R5551	BTS-120	2nd FM IF Amp. Cathode
R111	12KΩ	½		BTS-12K	2nd FM IF Amp. Decoupling-See Note 3
R112	47KΩ	½	6R6056	BTS-47K	De-emphasis
R113	47KΩ	½	6R6056	BTS-47K	AVC Diode Load
R114	470KΩ	½	6R6032	BTS-470K	AVC Network
R115	2.2 Meg.	½	6R3927	BTS-2.2 Meg.	AVC Network
R116	33KΩ	½	6R6410	BTS-33K	Ratio Det. Diode Load
R117	10 Meg.	½	6R2109	BTS-10 Meg.	AF Amp. Grid
R118	220KΩ	½	6R6015	BTS-220K	AF Amp. Plate
R119	33KΩ	½	6R6410	BTS-33K	Tone Compensation-See Note 4
R120	470KΩ	½	6R6032	BTS-470K	Output Grid
R121	470Ω	1	6R5593	BTA-470	Output Cathode
R122A	180Ω	■	17A690973	1 3/4A-350 *	Filter-Wire Wound
B	180Ω				Filter-Wire Wound

Note 1. Some models use 1 Meg. resistor in this application.
Note 2. Some models use 68Ω resistor in this application.
Note 3. Some models use 15KΩ resistor in this application.
Note 4. Some models use 68KΩ resistor in this application.
Note 5. Some models use resistors in parallel to obtain desired value.
* Set slider so that 175Ω in read from each end.

RADIO PARTS LIST (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T3	117VAC @ .58A	500VCT .075ADC	5VAC @ 2A	6.3VAC @ 2.5A	25B600684	PC-8403	P-3151 (18) (19)	PV-70A (18) (19)

(18) Drill new mounting holes.
(19) Add series resistor.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T9	8000Ω	3.6Ω	680Ω	.4Ω	25B600969	A-3878 ②	A-3020	RO-13 ②	② Drill one new mounting hole.

COILS (RF-IF)

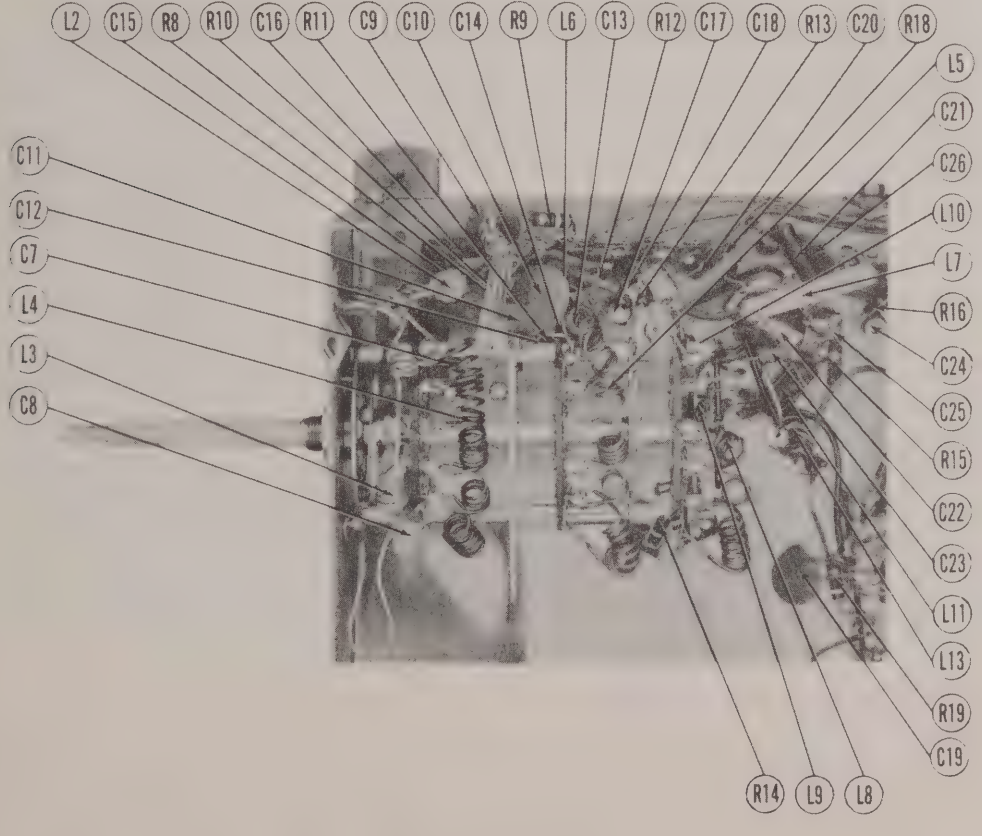
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
L29	FM Ant. Trans.	.2Ω	.2Ω	24A690544		
L30	RF Choke	.1Ω		24A90064		
L31	FM RF Coil	0Ω		24C690584		
L32	FM Osc. Coil	0Ω		24K600519		
L33	Loop Ant.	2.8Ω		24C690896		
L34	RF Choke	0Ω		24A791081		
L35	AM Osc. Coil	.4Ω	8.8Ω	24K691878	14-1073	Red dot
L36	1st AM IF	18Ω	18Ω	24B485553	16-6758	Green dot
L37	1st FM IF	2Ω	.8Ω	24B690540		Orange dot
L38	2nd AM IF	18Ω	18Ω	24K485555	16-6770	Pink dot
L39	2nd FM IF	4.7Ω	.7Ω	24B690541		Yellow dot
L40	Ratio Det. Trans.	2.2Ω	.4Ω	24K600893	17-3487	
L41	RF Choke	0Ω		24A692148		

DIAL LIGHTS

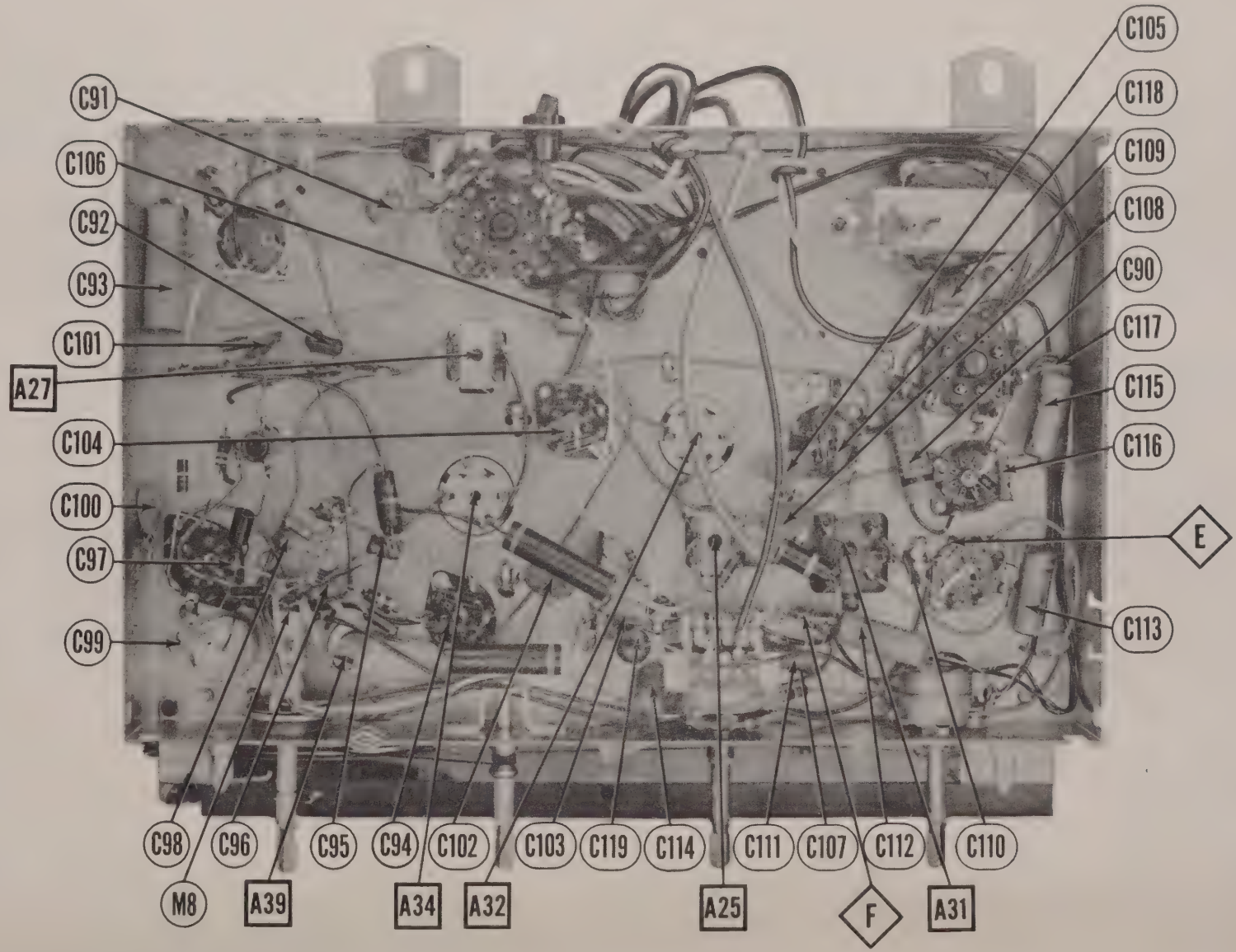
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					MOTOROLA PART No.		
M6	Bayonet	6-8	.15	Brown	65X11854		Type # 47
M7	Bayonet	6-8	.15	Brown	65X11854		Type # 47

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M8	Switch	40B690538	AM-FM
M9	Tuning Cap	19B691877	(29-485MMF, 33-181MMF)

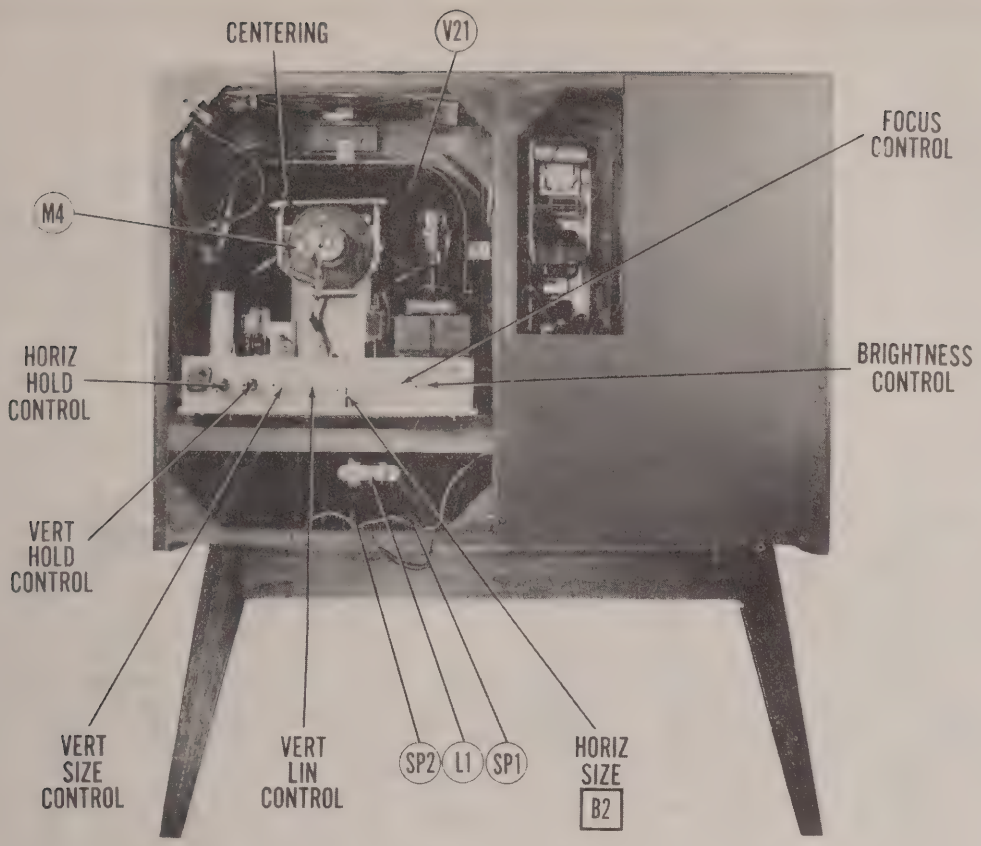


RF TUNER



RADIO CHASSIS-BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

RADIO CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



CABINET-REAR VIEW

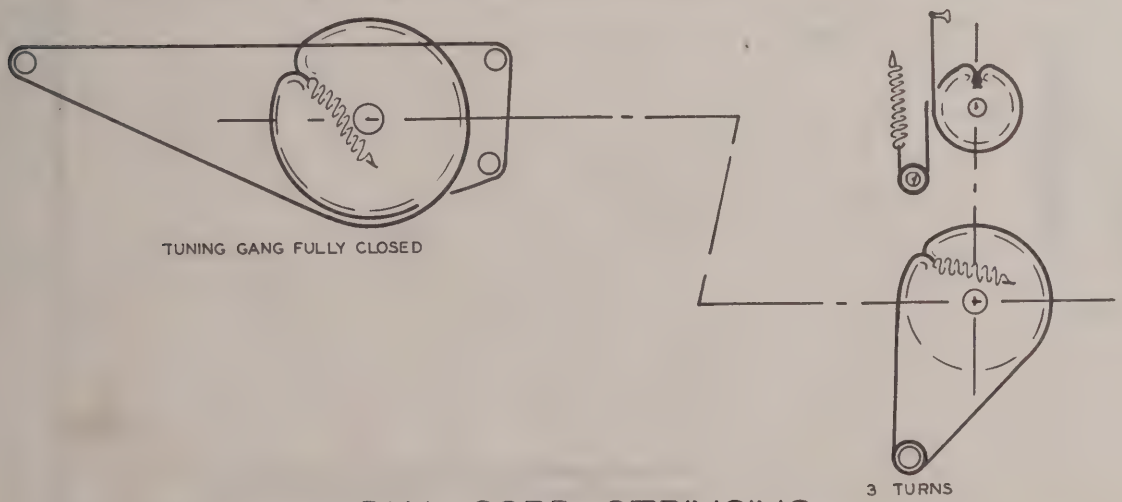
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.
Turn the horizontal hold control to the mid-position of its range.
Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.
Adjust the horizontal size slug (B2) until the picture fills the mask horizontally.

DISASSEMBLY INSTRUCTIONS

1. Remove four push-on type control knobs.
2. Remove six 1/4" hex head wood screws from rear cover. Remove rear cover.
3. Disconnect interlock.
4. Disconnect built in antenna.
5. Remove antenna to terminal strip.
6. Disconnect speaker leads.
7. Remove six 1/4" hex head screws holding chassis to cabinet. Remove chassis.
8. Remove four 5/16" hex head screws holding speaker in place. Remove speaker.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.



DIAL CORD STRINGING

GENERAL ELECTRIC
MODELS 404, 405, 410

GENERAL ELECTRIC
MODELS 404, 405, 410

GENERAL ELECTRIC MODEL 410

TRADE NAME	General Electric, Models 404, 405, 410
MANUFACTURER	General Electric Co., Electronics Dept., Electronics Park, Syracuse, New York
TYPE SET	AC-DC Operated Superheterodyne Receiver With Loop Antenna
TUBES (SIX)	Types 12SK7 RF Amp., 12SA7 Converter, 12BA6 IF Amp., 12SQ7 Det.-AVC-AF, 35L6GT Power Output 35Z5GT Rectifier
POWER SUPPLY	.24 Amp. @ 117 Volts AC — RATING .24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set pointer 1 7/8 inches to the right of the left hand end of the metal portion of the dial backplate.
Use isolation transformer if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.5MFD	High side to stator on front section of tuning gang. Low side to B-.	455KC (400 ∿ Mod.)	Tuning gang fully open	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1500KC	Tune for max. output.	"	A6, A7	"

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		G. E. PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	12SK7	12SK7	8N	
V2	Converter	12SA7	12SA7	8R	
V3	IF Amp.	12BA6	12BA6	7BK	
V4	Det.-AVC-AF	12SQ7	12SQ7	8Q	
V5	Power Output	35L6GT	35L6GT	7AC	
V6	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	G. E. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	50	150	RCE-050	PRS150/50-50		EDL5515		TVL-2453	Filter Red
B	50	150							Filter Yellow
C2	.05	400	UCC-045	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C3	2.2		RCN-039	SI3NPO	TCZ-2.2		NPOK-3		RF Coupling
C4	.02	400	UCC-041	P488-02	DF-203	PTE4S2		4TM-S2	Tuning Cap. Isolation
C5	.02	400	UCC-041	P488-02	DF-203	PTE4S2		4TM-S2	RF Amp. Dec.
C6	47	500	UCU-020	1468-00005	D6-470	5W5Q5	GP1K-47	1FM-45	Osc. Grid Cap
C7	.05	400	UCC-045	P488-05	DF-503	PTE4S5		4TM-S5	RF Bypass
C8 A	3500		RCW-3036	BPD-004	DD-502	PTE6D4	GP2M-004	29C19	Audio Coupling
B	220			SI220	D6-221	5W5T25	GP2K-220	19C13	AF Amp. Plate
C	5000			BPD-005	DD-502	PTE6D5	811-005	29C1	Audio Coupling
C9	.02	600	UCC-041	P688-02	DF-203	PTE6S2		6TM-S2	Output Plate Bypass
C10	.05	400	UCC-045	P488-05	DF-503	PTE4S5		72P51	Line Isolation
C11	.05	400	UCC-045	P488-05	DF-503	PTE4S5		72P51	Line Isolation
C12	.05	600	UCC-045	P688-05	DF-503	PTE6S5		6TM-S5	Line Filter

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	G. E. PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	500KΩ	½	RRC-149	Q13-133 *			Volume control
B	Switch		Not req.	76-1			Attach to R1A per instructions

* Slip dial cord pully over shaft of replacement control then wrap scotch tape around shaft to hold pully in place.

RESISTORS

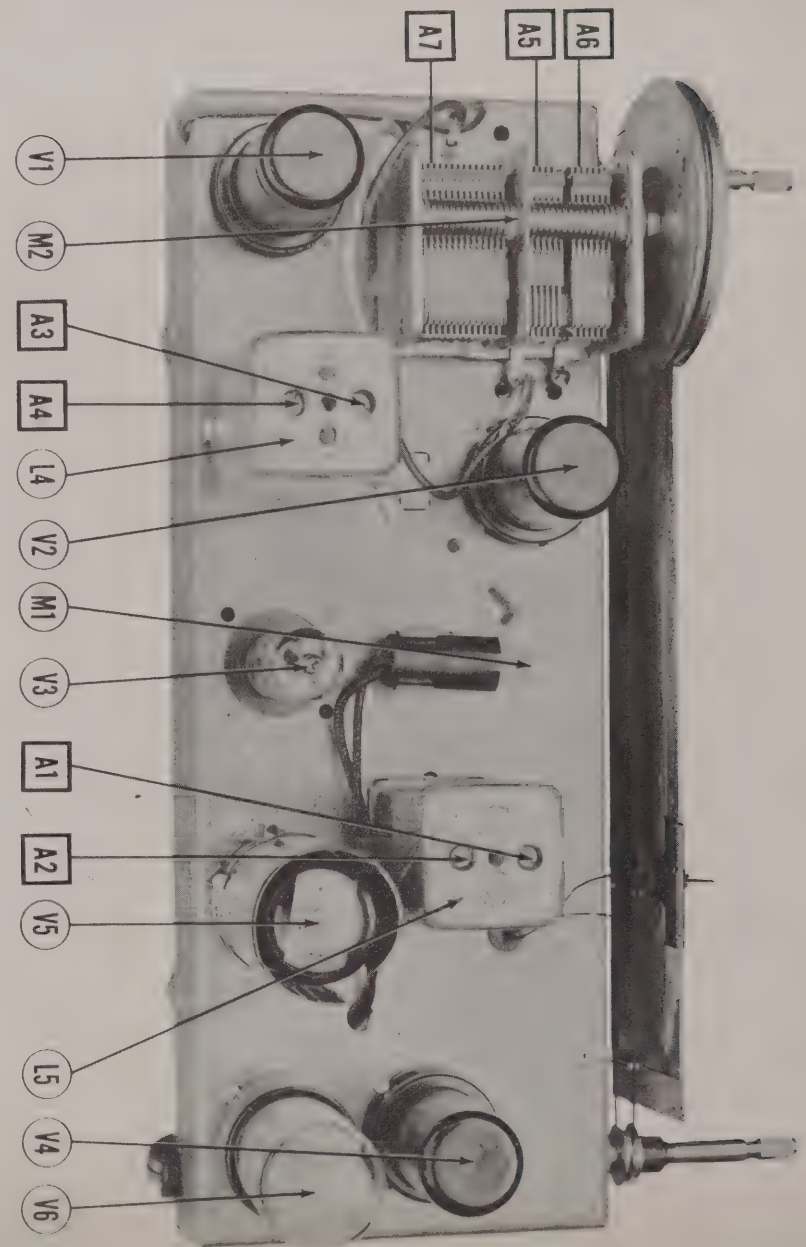
ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	G. E. PART No.	IRC PART No.	
R2	47Ω	½			RF Amp. Cathode - See Note
R3	2200Ω	½	URD-057	BTS-2200	RF Amp. Decoup.
R4	22K	½	URD-081		Mixer Grid
R5	2.2Meg	½	URD-129	BTS-2.2Meg	AVC Network
R6	68Ω	½	URD-021		IF Amp. Cathode
R7	4.7Meg	½	URD-137	BTS-4.7Meg	AF Amp. Grid
R8	470KΩ	½	URD-113	BTS-470K	AF Amp. Plate
R9	1Meg	½	URD-121	BTS-1Meg	Output Grid
R10	150Ω	½	URD-029	BTS-150	Output Cathode
R11	1000Ω	2	URF-049	BTB-1000	Filter
R12	22Ω	½	URD-009		Surge Limiter
R13	470KΩ	½	URD-113	BTS-470K	Isolation

Note: Some Models Use 100Ω Resistor In This Application

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		G. E. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2.7KΩ	3.6Ω	150Ω tapped @ 5Ω	.5Ω	RTO-083	A-3330	A-3031	RO-3	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA G. E. PART No.	VIKING PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP:				
SP1	PM	3.6Ω	ROP-020	46J6	46A1	
	CONE DIA.	V. C. DIA.				
SP2	4"X 6"	9/16"				

R F COILS

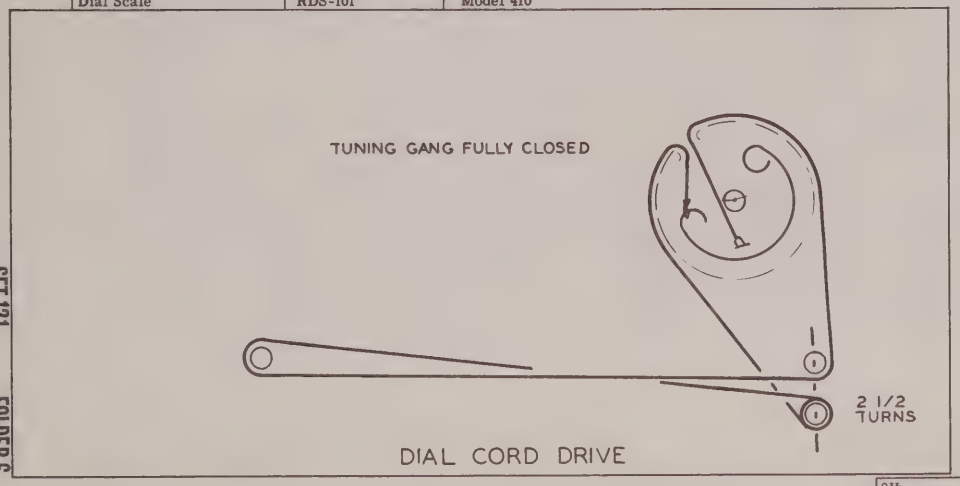
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA G. E. PART No.	MEISSNER PART No.	
L1A	Loop Ant.	2.3Ω		RAB-143		Includes Cabinet Back Model 410
B	Loop Ant.			RAB-142		Includes Cabinet Back Models 404, 405
L2	RF Coil	70Ω	14Ω	RLI-125		
L3	Osc. Coil	.7Ω	7.8Ω	RLC-105	14-1073	
L4	1st IF	16Ω	16Ω	RTL-115	16-6666	
L5	2nd IF	22Ω	47KΩ	RTL-116		

DIAL LIGHTS

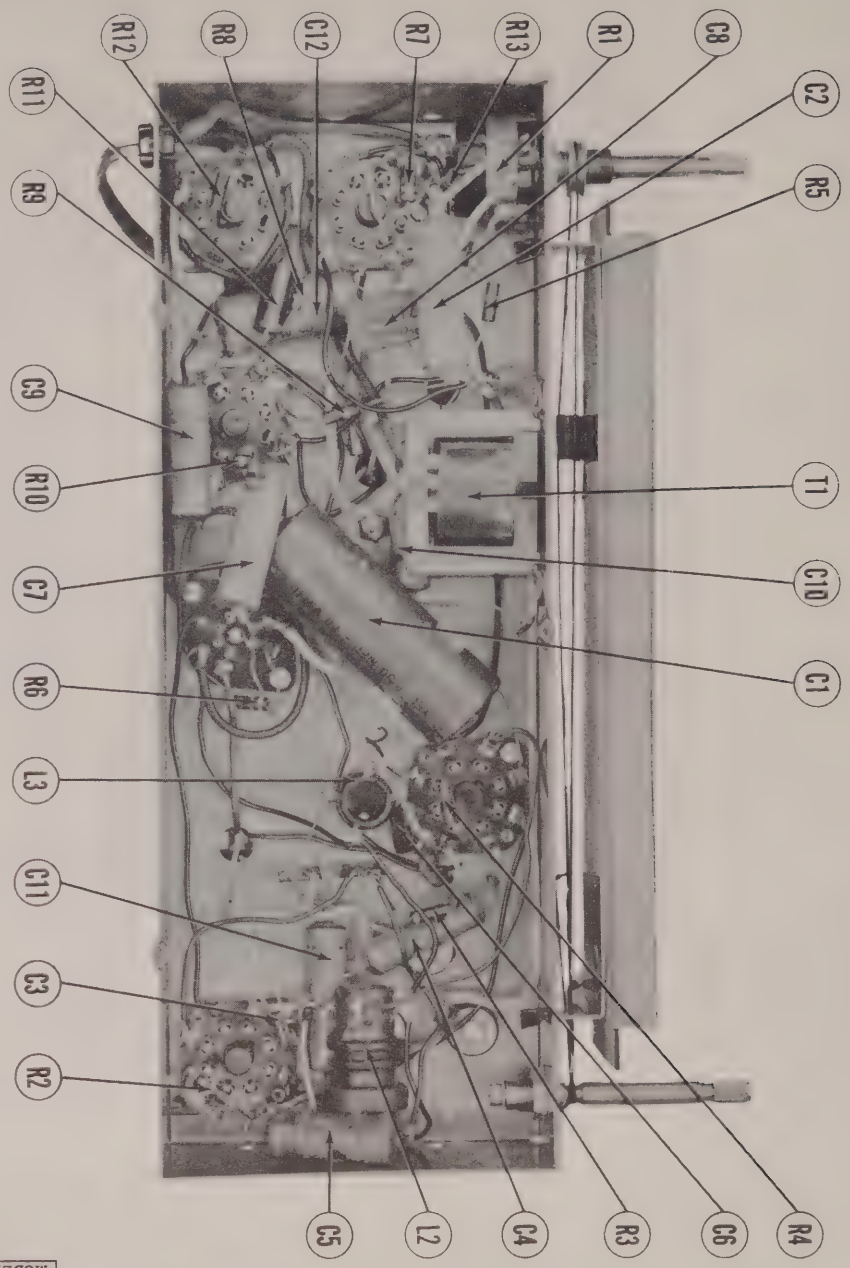
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA G. E. PART No.		NOTES
M2	Bayonet	6-8	.15	Brown			Type No. 47

MISCELLANEOUS

ITEM No.	PART NAME	G. E. PART No.	NOTES
M2	3 Gang Var. Cap	RCT-046	(25-467MMF, 13-225MMF, 19-154MMF)
	Cabinet	RAV-128	Model 410
	Cabinet	RAU-345	Model 404
	Cabinet	RAU-346	Model 405
	Knob	RDK-181	Model 404
	Knob	RDK-228	Model 410
	Knob	RDK-229	Model 405
	Dial Scale	RDS-100	Models 404, 405
	Dial Scale	RDS-101	Model 410



CHASSIS—BOTTOM VIEW



SET 121 FOLDER 6

GENERAL ELECTRIC MODEL 410

GENERAL ELECTRIC MODEL 410

PARTS LIST AND DESCRIPTIONS

HALLICRAFTERS MODEL S-38B

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Hallicrafters PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	90X12SA7	12SA7	8R	
V2	1st IF Amp.	90X12SK7	12SK7	8N	
V3	Det.-AVC-AF	90X12SQ7	12SQ7	8Q	
V4	Power Output	90X50L6GT	50L6GT	7AC	
V5	Rectifier	90X35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Hallicrafters PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	60	150	45B091	PRS150/40-40		EZ55515C		TVA-3451	Filter Red
B	40	150		-40				TVA-1205	Filter Yellow
C	40	150		PRS25/25					Filter Yellow
D	20	25							Output Cath. Blue
C2	.01	600	46AY103J	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Ant. Isolation
C3	2700	500	47X30A272J						Fixed Padder
C4	.02	400	46AW203J	P488-02	DF-203	PTE4S2		4TM-S2	AVC Filter
C5	220	500	47X20A221K	1468-0002	D6-221	5W5T2	GP2K-220	1FM-32	Osc. Grid Cap
C6	3000	500	47X30A302J	1464-003		1R5D3		MS-23	Fixed Padder
C7	2200	500	47X30A222J						Fixed Padder
C8	.05	200	46AU503J	P288-05	DF-503	PTE4S5		2TM-S5	RF Bypass
C9	.25	200	46AT254J	P488-25		GT2P25		2TM-P25	RF Bypass
C10	.05	200	46AU503J	P288-05	DF-503	PTE4S5		2TM-S5	IF Cath. Bypass
C11	100	500	47X20B101K	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C12	.01	600	46AY103J	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Audio Coupling
C13A	220		46A151	SI220	D6-221	5W5T2	GP2K-220		Diode RF Filter
B	2000			BPD-002	DD-202	PTE6D2	801-002	34C3	Audio Coupling
C	220			SI220	D6-221	5W5T25	GP2K-220		AF Amp. Plate
D	5000			BPD-005	DD-502	PTE6D5	811-005		Audio Coupling
C14	.02	600	46AY203J	P688-02	DF-203	PTE6S2		6TM-S2	Output Plate
C15	470	500	CM20A471M	1468-0005	D6-471	5W5T5	GP1K-470	1FM-35	RF Bypass
C16	.02	600	46AY203J	P688-02	DF-203	PTE6S2		6TM-S2	Line Filter
C17	.1	400	46AV104J	P488-1	DF-104	PTE4P1		72P52	Line Isolation *

* Model S-38A uses .25MFD in this application.

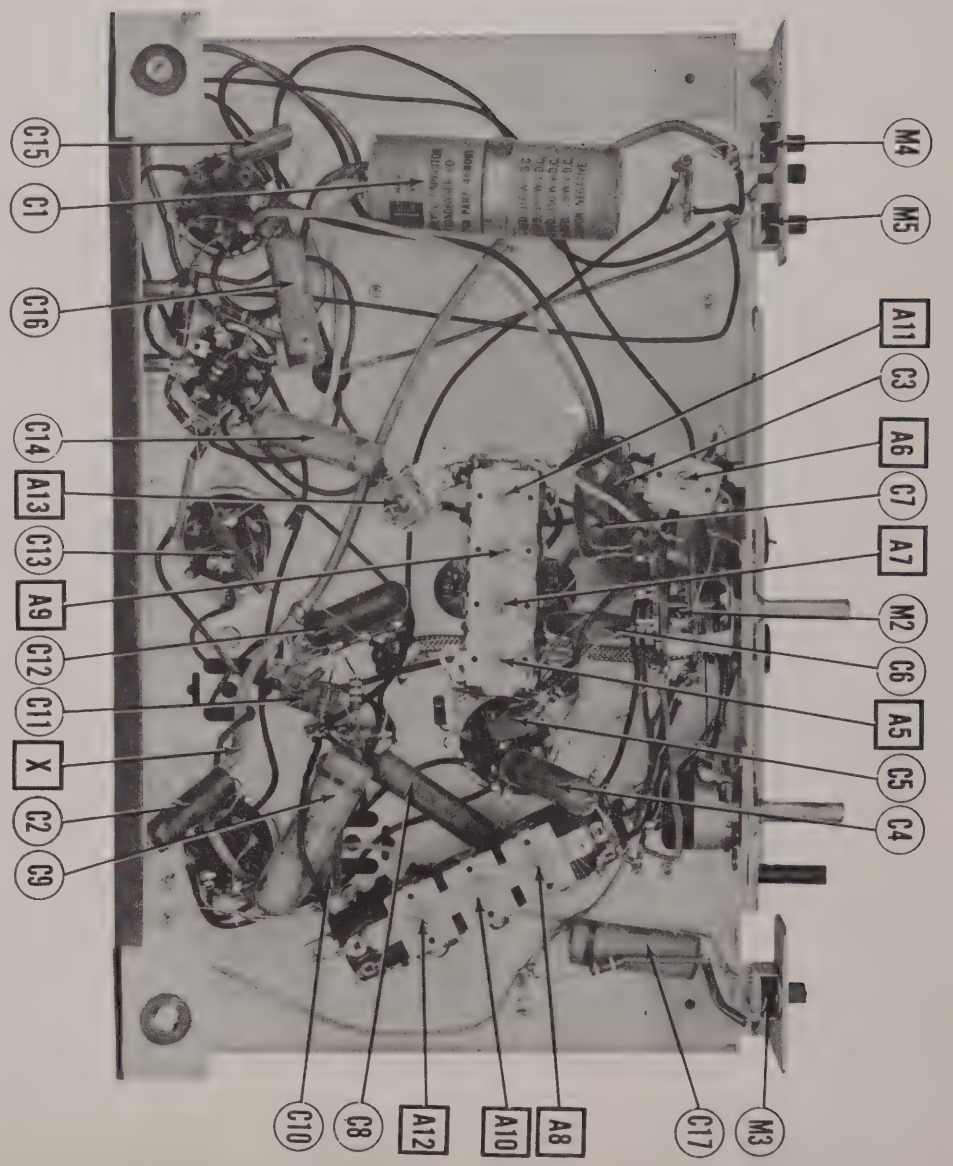
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Hallicrafters PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	2Meg	½	25B896	Q13-139	AG-66-Z	B-76-S	Volume control
B	Shaft		Not req.	Not req.	RS-2	Not req.	Attach to R1A per instructions
C	Switch		Not req.	76-1	SWB	Not req.	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Hallicrafters PART No.	IRC PART No.	IDENTIFICATION CODES
R2	470KΩ	½	23X20X474M		Converter Grid
R3	47Ω	½	23X20X470M		Parasitic Supp
R4	22KΩ	½	23X20X223M		Oscillator Grid
R5	33Ω	½			Parasitic Supp - See Note 1.
R6	1.5Meg	½		BTS-1.5Meg	AVC Network - See Note 2.
R7	470Ω	½	23X20X471K	BTS-470	Bias Network
R8	390Ω	½	23X20X391	BTS-390	IF Amp. Cathode
R9	56KΩ	½		BTS-56K	Diode Filter - See Note 3
R10	470KΩ	½	23X20X474M	BTS-470K	Diode Load
R11	15Meg	½	23X20X106M	BTS-15Meg	AF Amp. Grid - See Note 4
R12	220KΩ	½	23X20X224M	BTS-220K	AF Amp. Plate
R13	470KΩ	½	23X20X474M	BTS-470K	Output Grid
R14	150Ω	½	23X20X151K	BTS-150	Output Cathode
R15	15Ω	½	23X20X150M	BW-½-15	Output Transformer Shunt

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	Hallicrafters PART No.	IRC PART No.	
R16	10KΩ	1/2	23X20X103M		Antenna Coil Shunt
R17	1000Ω	1/2	23X20X102M	BTS-1000	Filter
R18	220Ω	1	23X30X221M	BTA-220	Filter
R19	33Ω	1/2			Surge Limiter - See Note 1.
R20	330Ω	1/2	23X20X221M	BTS-330	Pilot Light Shunt

Note 1. Some models use 22Ω resistor in this application.
Note 2. Some models use 2.2meg resistor in this application.
Note 3. Some models use 47KΩ resistor in this application.
Note 4. Some models use 10meg resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		Hallicrafters PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	1.7KΩ	3.2Ω	147Ω	.8Ω	55A127	A3876	A 2928	RO-2	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	Hallicrafters PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	3.2Ω	85C030	ST-105 Mod. P5-X	5A1	
	CONE DIA.	V. C. DIA.				
SP2	4 1/2"	1/2"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	Hallicrafters PART No.	MEISSNER PART No.	
L1A	Ant. Coil	25Ω	5.5Ω	51C821		Band 1
B	Ant. Coil	1.1Ω	1.5Ω			Band 2
C	Ant. Coil	1.1Ω	.2Ω			Band 3
L 2	Ant. Coil	.5Ω	0Ω	51B1015		Band 4
L3A	Osc. Coil	2.8Ω		51C822		Band 1
B	Osc. Coil	3.2Ω				Band 2
C	Osc. Coil	.1Ω				Band 3
D	Osc. Coil	0Ω				Band 4
L4	1st IF	22Ω	22Ω	50B183		
L5	2nd IF	22Ω	22Ω	50B184		

DIAL LIGHTS

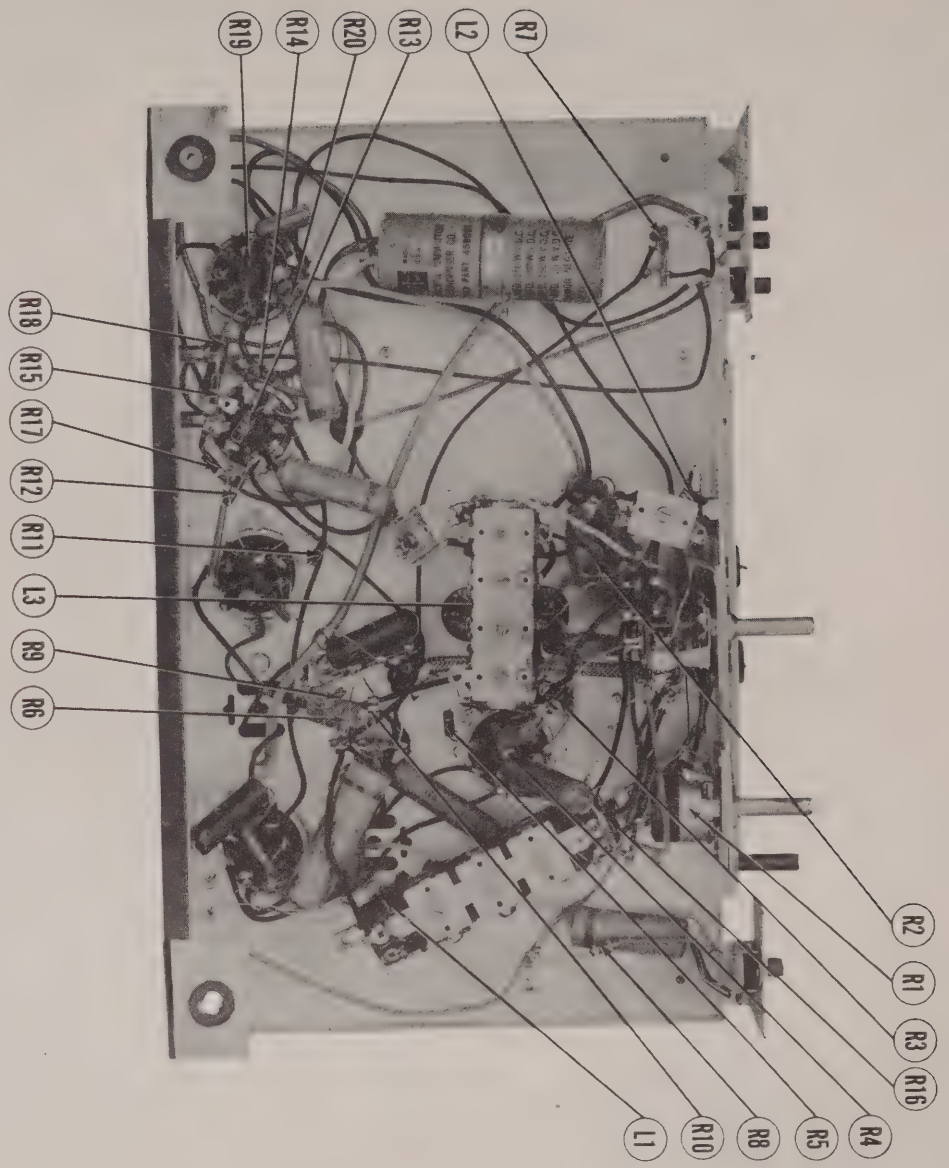
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					Hallicrafters PART No.		
M1	Bayonet	6-8	.15	Brown	39A004		Type Number 47

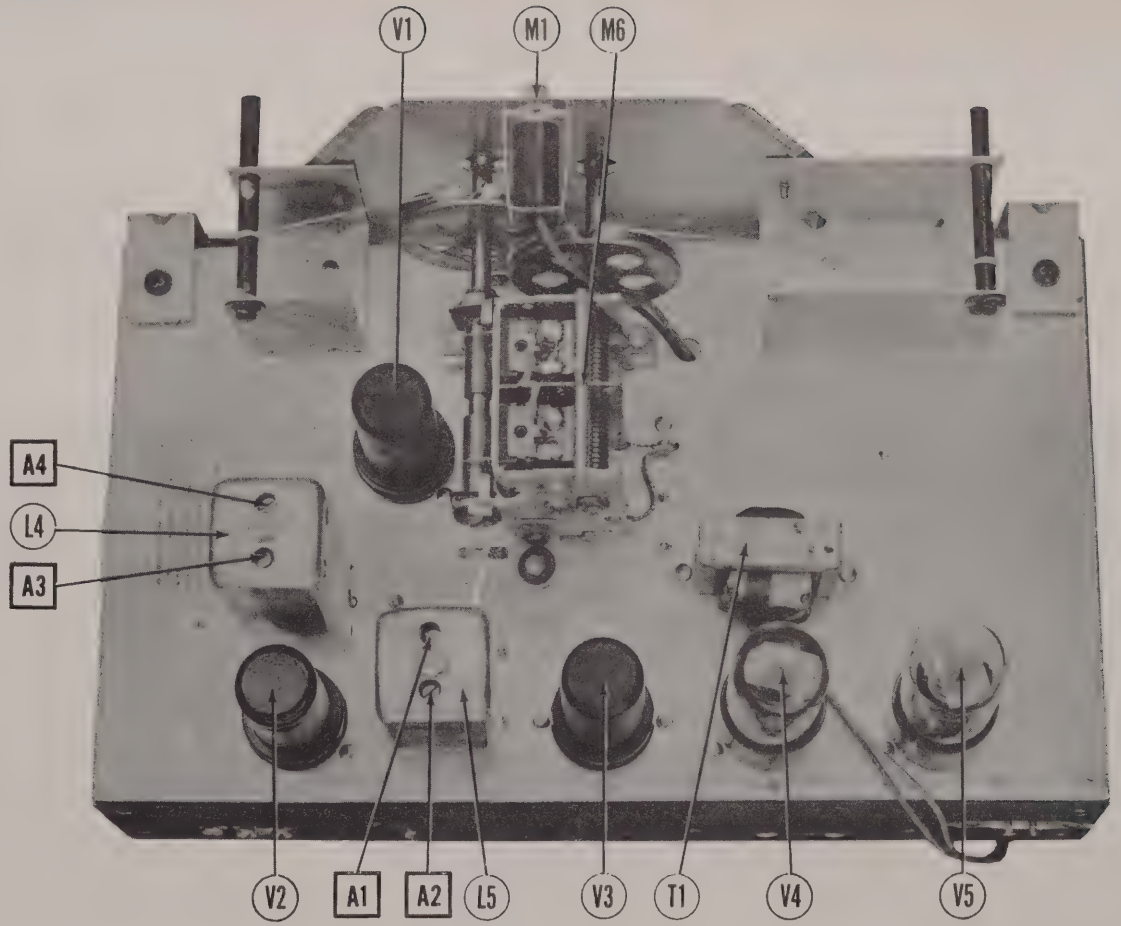
MISCELLANEOUS

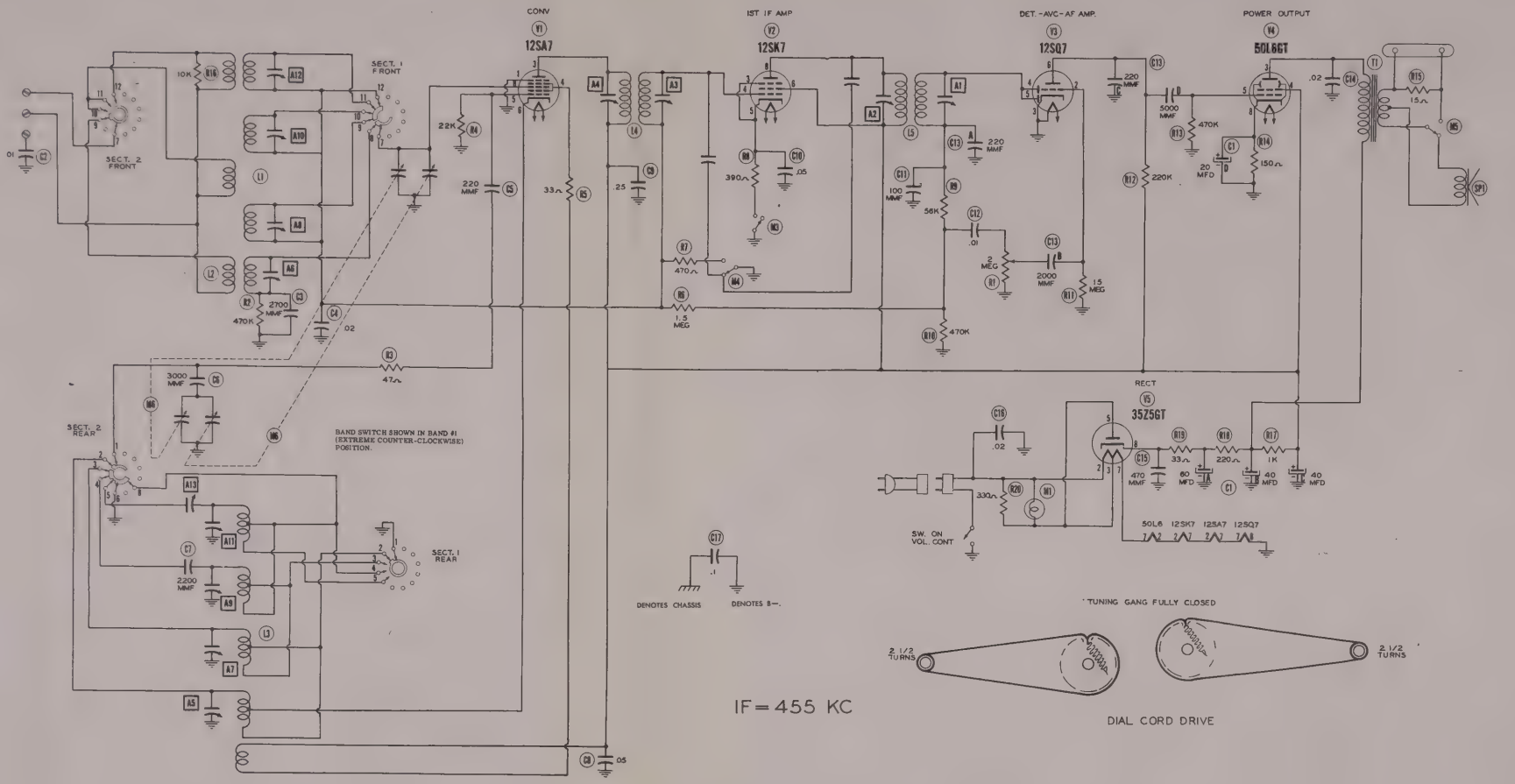
ITEM No.	PART NAME	Hallicrafters PART No.	NOTES
M2	Switch	60C393	Band
M3	Switch	60A244	Receive - Standby
M4	Switch	60A243	AM-CW
M5	Switch	60A243	Speaker - Phones
M6	2 Gang Var. Cap	48C162-1	(12-461MMF, 12-461MMF)
A6	Trimmer	44A039	Band #4 Ant. Adj.
A13	Padder	44A349	Band # 1 Osc. Adj.
	Dial Scale	83C373	

SET 121 FOLDER 7

CHASSIS—BOTTOM VIEW




V1
M1
M6
A4
L4
A3
V2
A1
A2
L5
V3
T1
V4
V5



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	0V	25VAC	85VDC	85VDC	8-7.7VDC	0V	13VAC	.5VDC
V 2	12SK7	0V	27VAC	2.8VDC	▲-.5VDC ● 0V	2.8VDC	85VDC	25VAC	85VDC
V 3	12SQ7	0V	-.4VDC	0V	▲-.6VDC ●-4.6VDC	▲-.6VDC ●-4.6VDC	85VDC	13VAC	0V
V 4	50L6GT	0V	37VAC	95VDC	85VDC	0V	105VDC	85VAC	6VDC
V 5	35L6GT	0V	117VAC	110VAC	115VDC	110VAC	0V	85VAC	117VDC

8 TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	0Ω	25Ω	†1.3KΩ	†1.3KΩ	33KΩ	1.1Ω	12Ω	2Meg
V 2	12SK7	0Ω	28Ω	390Ω	▲ 2Meg ●470Ω	390Ω	†1.3KΩ	25Ω	†1.3KΩ
V 3	12SQ7	0Ω	15Meg	0Ω	▲ 500KΩ ● 400KΩ	▲ 500KΩ ● 400KΩ	† 220KΩ	12Ω	0Ω
V 4	50L6GT	0Ω	38Ω	†400Ω	†1.2KΩ	470KΩ	†250Ω	90Ω	150Ω
V 5	35L6GT	Inf.	120Ω	115Ω	†33Ω	115Ω	Inf.	90Ω	40KΩ

ALL MEASUREMENTS TAKEN WITH BANDSWITCH IN POSITION 1
RECEIVE1- STAND BY SWITCH IN RECEIVE POSITION
▲ AM-CW SWITCH IN AM
● AM- CW SWITCH IN CW

† MEASURED FROM PIN 8 OF V5

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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PHOTOFACT* Folder

*TRADE MARK

SILVERTONE

143A (CH.100.111)

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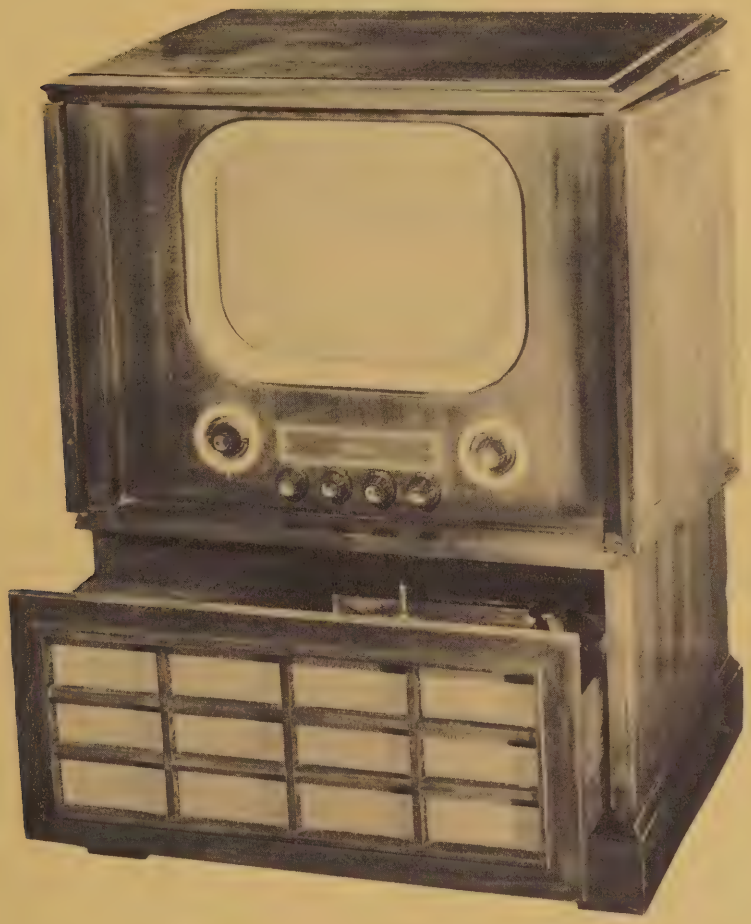

SILVERTONE
143A (CH.100.111)

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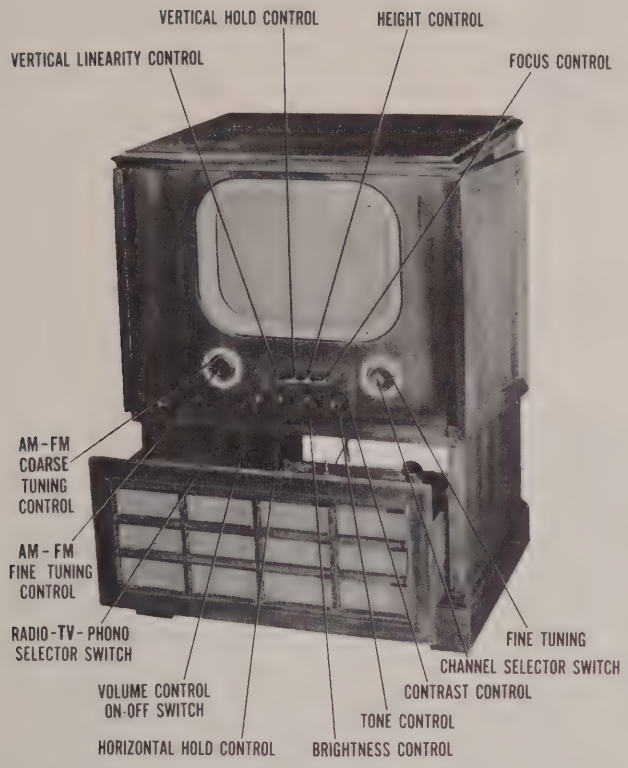
SILVERTONE
MODEL 143A (Ch. 100.111)



TRADE NAME	Silverton, Model 143A (Chassis 100.111)
SUPPLIER	Sears, Roebuck And Company, 925 S. Homan, Chicago, Illinois
TYPE SET	TV-AM-FM-Phono Combination Receiver
TUBES	Thirty One
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATINGS	2.2Amp. @ 117 Volts AC (TV) .81 Amp. @ 117 Volts AC (Radio)
TUNING RANGE -	(TV) Channels 2 thru 13 (FM) 88-108MC (AM) 540-1620KC

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FOR SERVICE INFORMATION ON SILVERTONE RECORD CHANGER UNIT MODEL 100.216, SEE SIMILAR V-M CHANGER MODEL 950 - RECORD CHANGER MANUAL CM-3 OR PHOTOFACT SET #107 - FOLDER 13.

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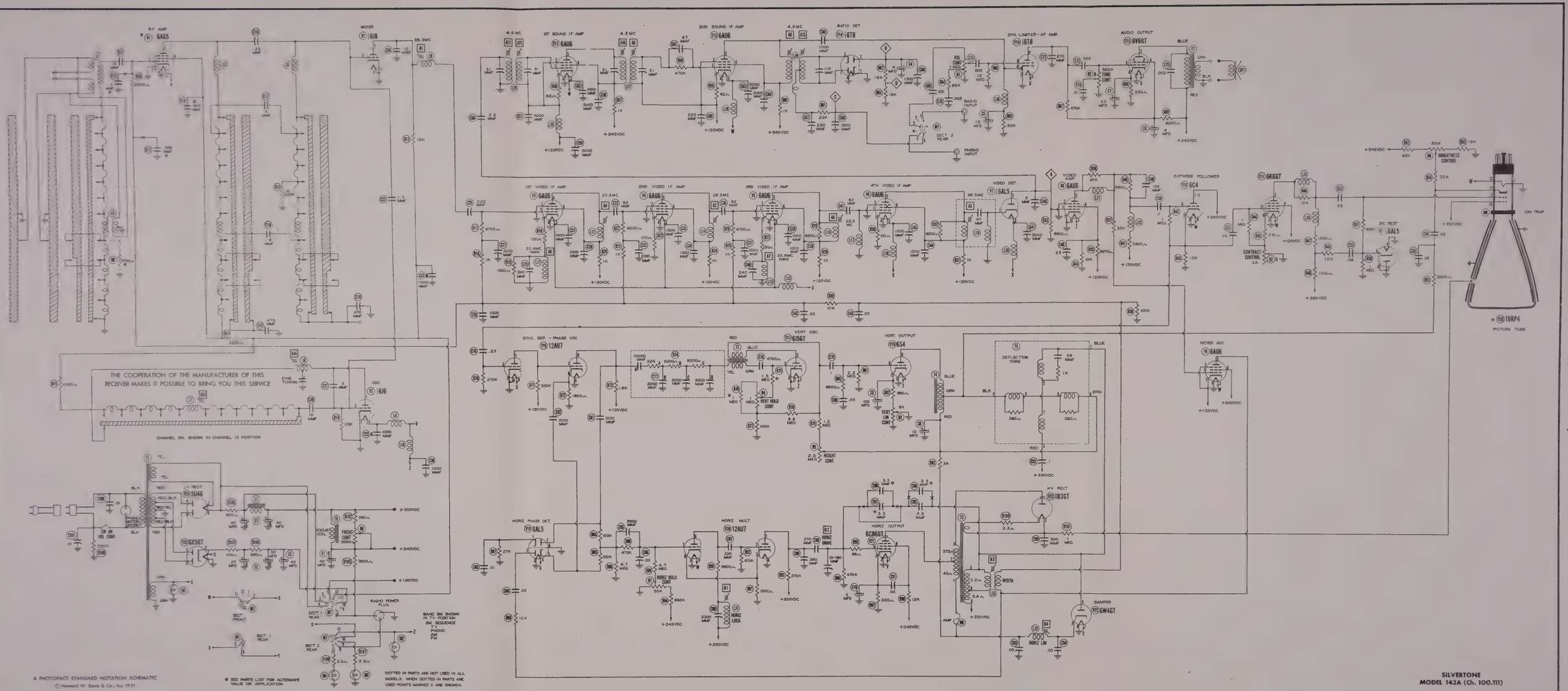
MODEL 143A (Ch. 100.111)



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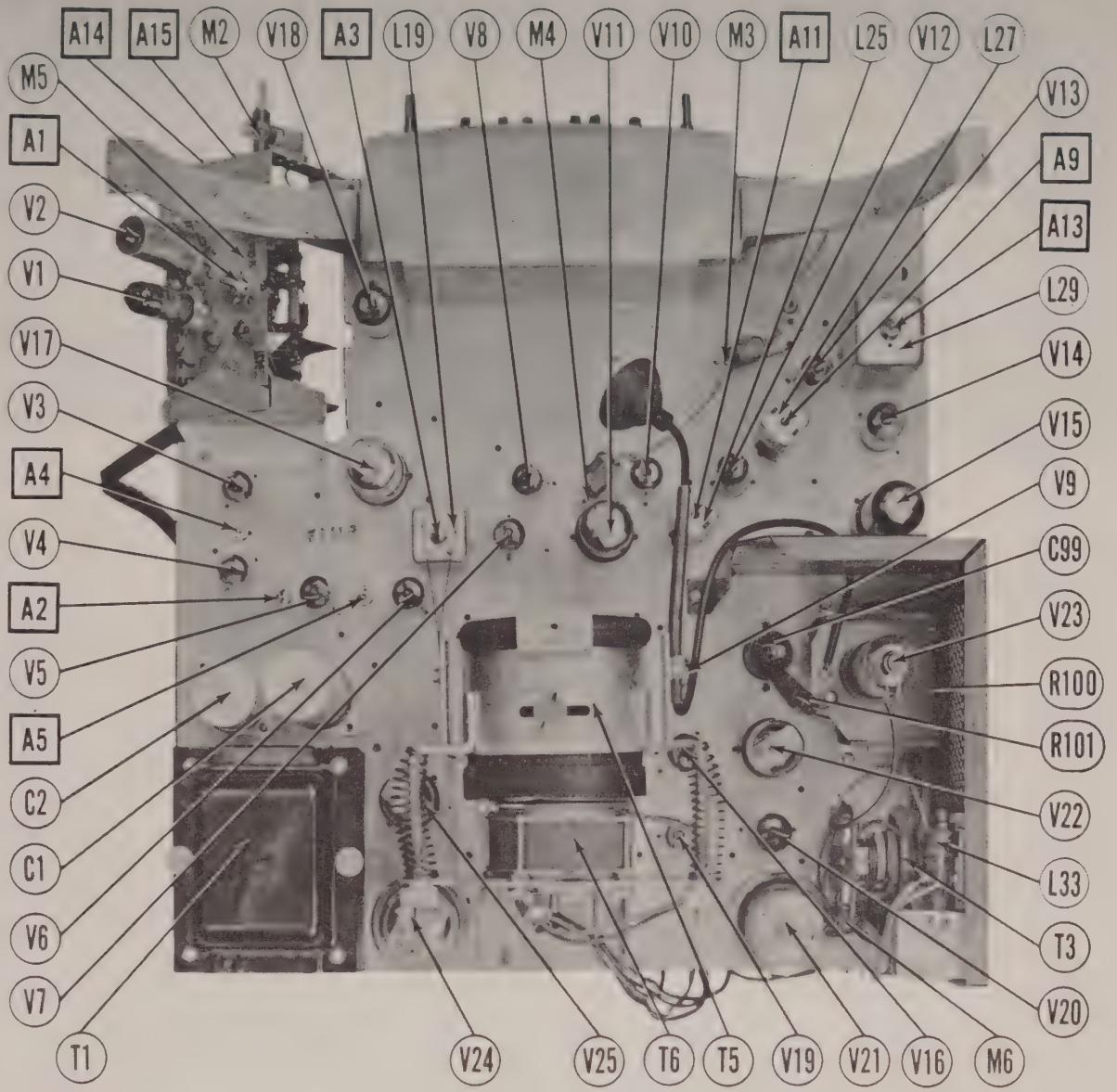
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.

SILVERTONE
MODEL 143A (Ch. 100.111)

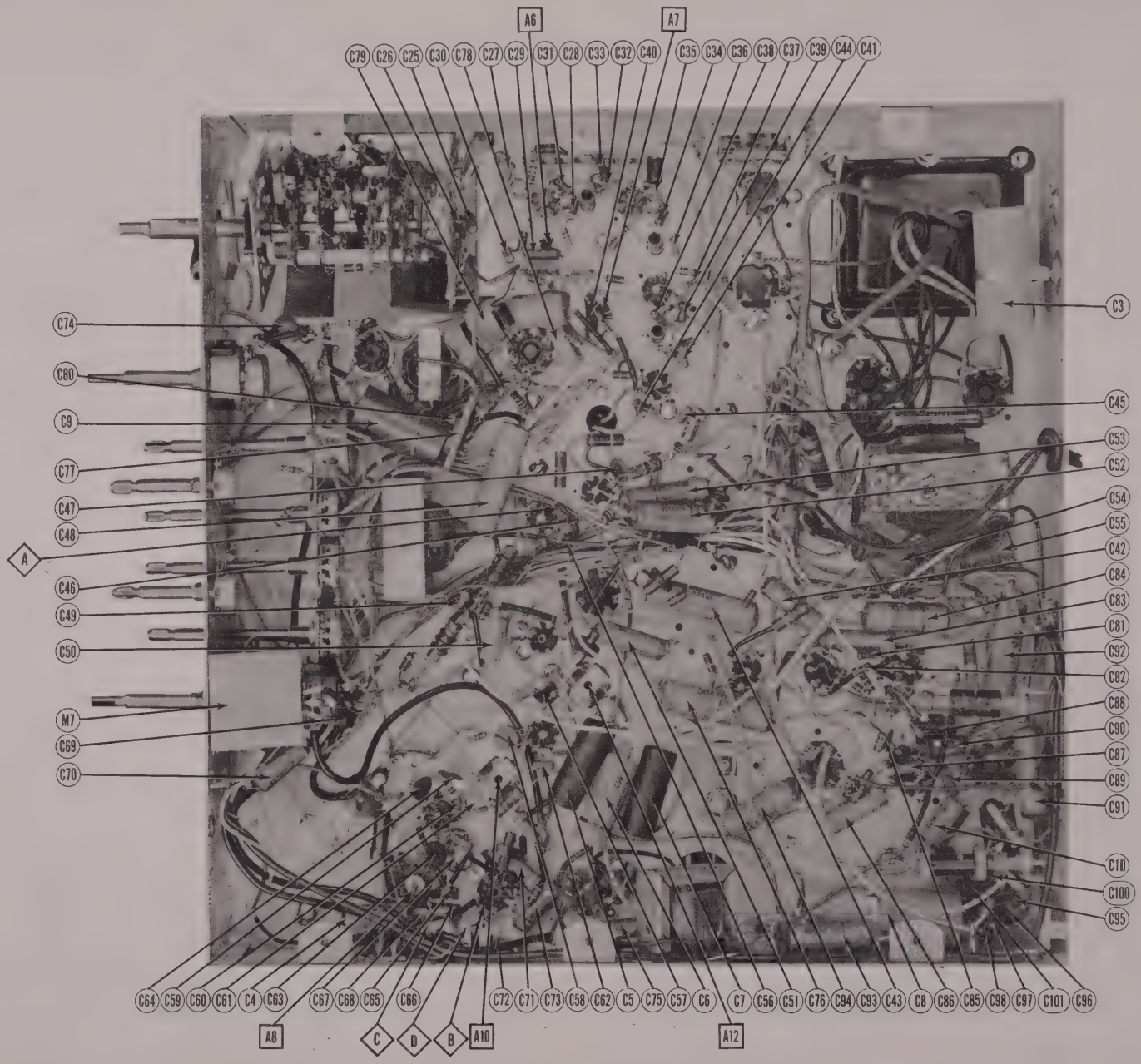
SILVERTONE
MODEL 143A (Ch. 100.111)



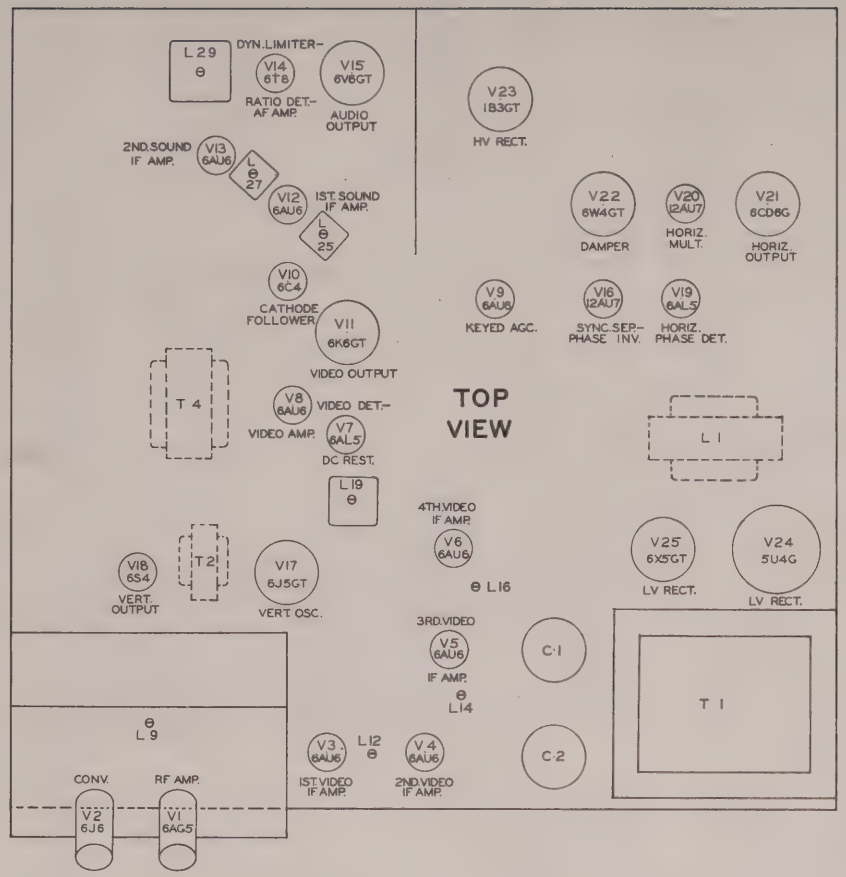
CHASSIS TOP VIEW

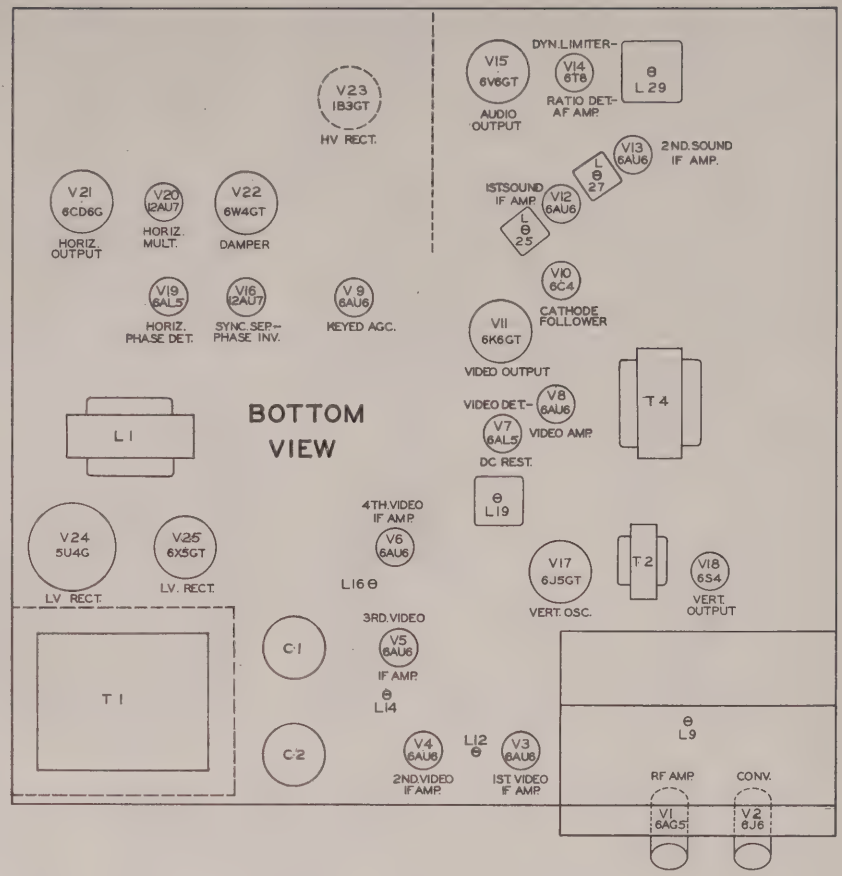
MODEL 143A (Ch. 100.111)

SILVERTONE



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

MODEL 143A (Ch. 100.111)

SILVERTONE

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The end of the high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) and replace it with a 6J6 which has pin 1 removed. This will disable the local oscillator and prevent erroneous indications.

Connect the negative lead of a 3 volt battery to the junction of A39 and C42, connect the positive lead to chassis.

Detune trap coils A6 and A7 by squeezing the turns together, failure to do so may cause IF strip to oscillate.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	26.3 (Unmod.)	Any	DC probe to point (A). Common to chassis.	A1, A2	Adjust for maximum deflection.
2	"	"	24.5MC	"	"	A3	"
3.	"	"	23.5MC	"	"	A4, A5	"
4.	"	"	22.4MC	"	"	A6	Expand coil turns for MINIMUM deflection.
5.	"	"	22.8MC	"	"	A7	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	High side to an ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	25MC (10MC SWP)	22.25MC 26.75MC	Any	Vert. amp. to point (A). Low side to chassis.		Check for response curve similar to fig. 1. If necessary retouch A1 thru A6 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (cathode) of 6AL5 (V7). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe thru 10KΩ to point (B). Common to chassis.	A8, A9, A10, A11, A12	Adjust for maximum deflection.
8.	"	"	"	"	DC probe to point (C). Common to point (D).	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Continue with step 10.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (grid) of 6AW6 (V12). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. amp. to point (B). Low side to chassis.	A8, A9, A10	Disconnect stabilizor capacitor C4. Adjust for maximum amplitude and symmetry as per figure 2.
8.	"	High side to pin 1 (Cathode) of 6AL5 (V7). Low side to chassis.	"	"	"	"	A11, A12	"
9.	"	"	"	"	"	Vert. amp. to point (C). Low side to chassis.	A13, A8	Reconnect capacitor C4. Adjust A13 so 4.5MC occurs at center of crossover lines as per fig. 3. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. amp. to point (A). Low side to chassis.	A14	Adjust to place sound marker in "notch" as shown in figure 4.
11.	"	"	207MC (10MC SWP)	205.25MC 209.75MC	12	"		Check all high band channels to see that sound marker can be placed in "notch" well within the range of the fine tuning control. If not compromise adjustment of A14 will be required.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75 MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
12.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A15	Adjust to place sound markersin " notch" as shown in figure 4.
13.	"	"	79MC (10MC SWP)	77.25MC 81.75MC	5	"		Check all low band channels to see that sound marker can be placed in "notch" well within the range of the fine tuning control. If not, compromise adjustment of A15 will be required.
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

THE RF PORTION OF THIS TUNER HAS BEEN ALIGNED AT THE FACTORY AND SHOULD NOT REQUIRE ADJUSTMENT IN THE FIELD.

RADIO ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial scale, turn tuning gang fully closed and set the index to the heavy black line near low frequency end of the dial scale.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use and insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
14.	.1MFD	High side to pin 7 (grid) of 6BE6 (V28). Low side to chassis.	455KC (400 ∿ Mod.)	AM (second position clockwise)	Tuning gang fully open.	Across voice coil	A16, A17, A18, A19,	Adjust for maximum output.
15.	"	"	1620KC	"	"	"	A20	"
16.		Loop	1400KC	"	Tune for max. output.	"	A21	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
17.		Loop	600KC	"	"	"	A22	" Repeat steps 16 and 17 until no further improvement can be made.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
18.	.01MFD	High side to stator on front "FM" section of tuning gang. Low side to chassis.	10.7MC (Unmod.)	FM (max. counter clockwise)	Tuning gang fully open	DC probe to point ◇E◇. Common to chassis.	A23, A24, A25, A26, A27	Adjust for maximum deflection.
19.	"	"	"	"	"	DC probe to point ◇F◇. Common to point ◇E◇.	A28	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Continue with step 21.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
18.	.01MFD	High side to pin 1 (grid) of 6BA6 (V29). Low side to chassis.	10.7MC (450KC SWP)	FM (maximum counter clockwise)	Point of non-interference	Vert. amp. to point ◇E◇. Low side to chassis.	A23, A24, A25	Disconnect stabilizor capacitor C102. Adjust for maximum amplitude and symmetry as per figure 5.
19.	"	High side to stator on front "FM" section of tuning gang. Low side to chassis.	"	"	"	"	A26, A27	"
20.	"	"	"	"	"	Vert. amp. to point ◇F◇. Low side to chassis.	A28	Reconnect capacitor C102. Adjust A28 so 10.7MC occurs at center of crossover lines as per fig. 6. SLIGHTLY retouch A23 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
21	270Ω carbon resistor	High side thru 270Ω to "FM" antenna terminal.	109MC (Unmod)	FM	Tuning gang fully open.	DC probe to point ◇E◇. Common to chassis.	A29	Adjust for maximum deflection.
22	"	"	106MC	"	Tune for max. deflection.		A30	"

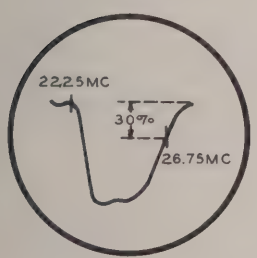


FIG. 1

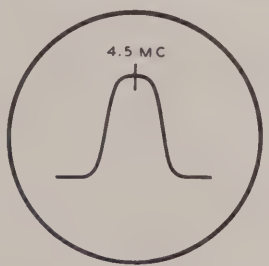


FIG. 2

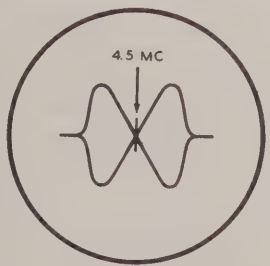


FIG. 3

FIG. 4

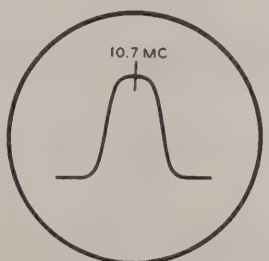


FIG. 5

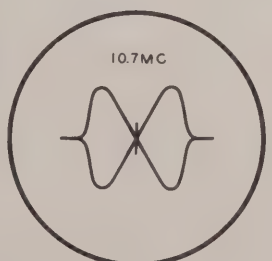


FIG. 6

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.6VDC	0V	6.3VAC	0V	100VDC	100VDC	0V		
V 2	6J6	75VDC	85VDC	0V	6.3VAC	-.9VDC	§-3.3VDC	0V		
V 3	6AU6	-.6VDC	0V	6.3VAC	0V	110VDC	110VDC	1.4VDC		
V 4	6AU6	-.6VDC	0V	6.3VAC	0V	110VDC	110VDC	1.2VDC		
V 5	6AU6	-.6VDC	0V	6.3VAC	0V	115VDC	115VDC	1VDC		
V 6	6AU6	0V	0V	6.3VAC	0V	115VDC	115VDC	.9VDC		
V 7	6AL5	0V	0V	6.3VAC	0V	.4VDC	0V	-.4VDC		
V 8	6AU6	-.4VDC	0V	6.3VAC	0V	58VDC	55VDC	0V		
V 9	6AU6	55VDC	120VDC	6.3VAC	0V	-.5VDC	245VDC	120VDC		
V 10	6C4	245VDC	0V	0V	6.3VAC	245VDC	15VDC	130VDC		
V 11	6K6GT	0V	0V	320VDC	120VDC	- 3.2VDC	0V	6.3VAC	40VDC	
V 12	6AU6	#.1VDC	#.1VDC	6.3VAC	0V	#115VDC	#115VDC	#1.2VDC		
V 13	6AU6	#0V	#0V	6.3VAC	0V	#115VDC	#115VDC	#.8VDC		
V 14	6T8	-.8VDC	-1.5VDC	-.8VDC	0V	6.3VAC	-.8VDC	0V	-.8VDC	75VDC
V 15	6V6GT	0V	6.3VAC	225VDC	230VDC	0V	250VDC	0V	15VDC	
V 16	12AU7	25VDC	-2VDC	0V	0V	0V	95VDC	25VDC	23VDC	6.3VAC
V 17	6J5GT	0V	6.3VAC	155VDC 75VDC	0V	-32VDC -28VDC	0V	0V	0V	
V 18	6S4	0V	35VDC 12VDC	0V	6.3VAC	0V	0V	0V	0V	430VDC
V 19	6AL5	0V	0V	0V	6.3VAC	6VDC	0V	-5VDC		
V 20	12AU7	110VDC	-3.6VDC	16VDC	0V	0V	300VDC	.4VDC	16VDC	6.3VAC
V 21	6CD6G	0V	0V	27VDC	0V	0V	0V	6.3VAC	160VDC	*
V 22	6W4GT	16VDC 0V	0V	460VDC	0V	345VDC	0V	6.3VAC	0V	
V 23	1B3GT	* DO NOT MEASURE								
V 24	5U4G	120VDC	360VDC	0V	345VAC	0V	345VAC	0V	360VDC	
V 25	6X5GT	0V	6.3VAC	170VAC	360VAC	170VAC	0V	0V	175VDC	
V 26	16RP4	0V	.4VDC	PIN 10 35-VDC	PIN 110VDC	11 25VDC	PIN 12 6.3VAC			

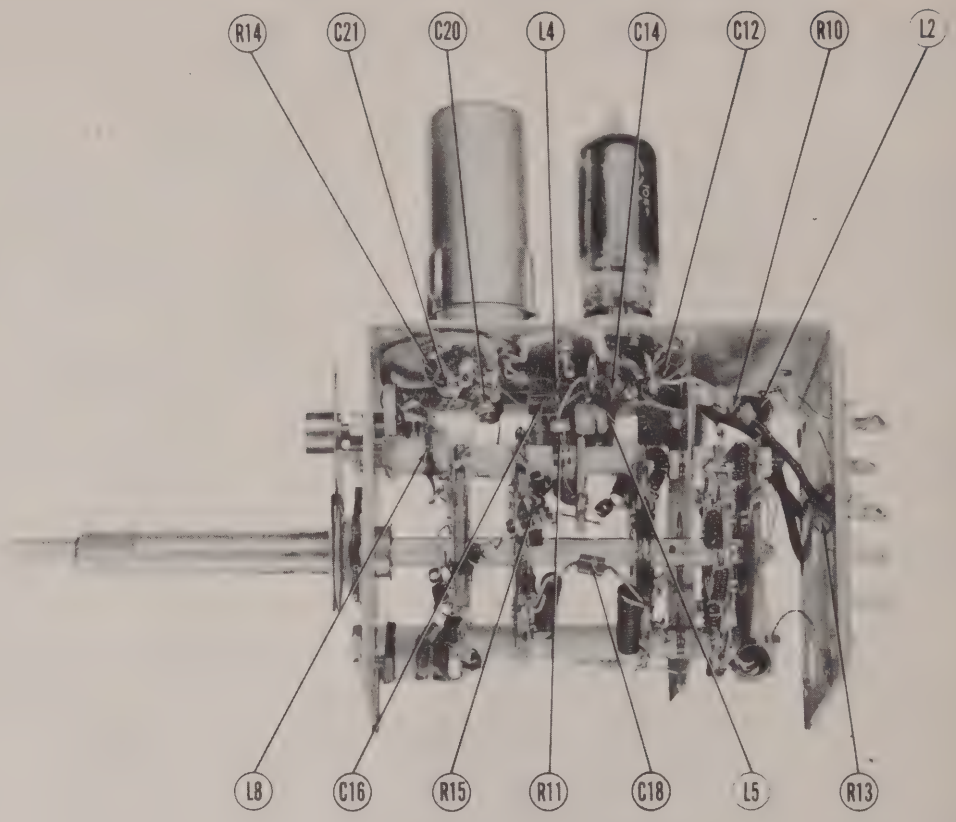
FOCUS CONTROL COUNTER CLOCKWISE
FUNCTION SWITCH IN "TV" POSITION
§ TAKEN WITH VACUUM TUBE VOLTMETER
# MEASURED FROM 120VDC POINT
* DO NOT MEASURE

VOLTAGE READINGS

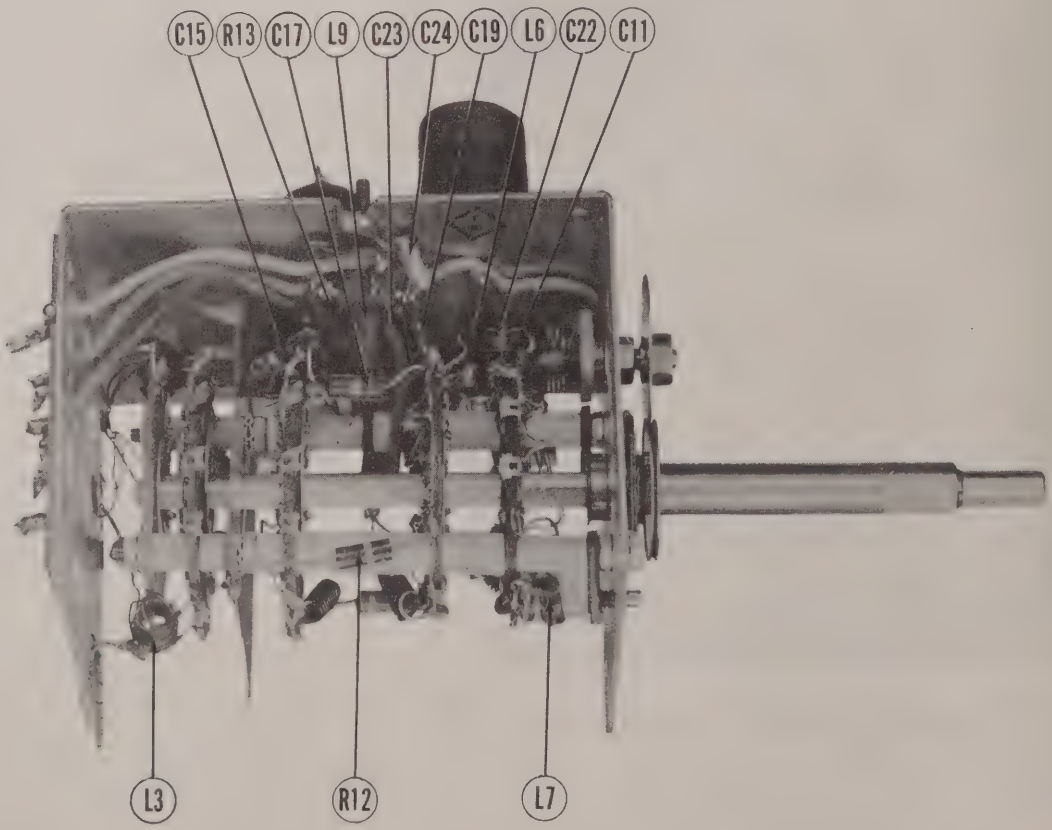
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	110KΩ	0Ω	.1Ω	0Ω	†3.2KΩ	†3.2KΩ	0Ω		
V 2	6J6	†5.7KΩ	† 16KΩ	0Ω	.3Ω	270KΩ	22KΩ	0Ω		
V 3	6AU6	115KΩ	0Ω	.1Ω	0Ω	†2KΩ	† 2KΩ	150Ω		
V 4	6AU6	120KΩ	0Ω	.1Ω	0Ω	†2KΩ	†2KΩ	100Ω		
V 5	6AU6	115KΩ	0Ω	.1Ω	0Ω	†2KΩ	†2KΩ	120Ω		
V 6	6AU6	3Ω	0Ω	.3Ω	0Ω	†2KΩ	†2KΩ	100Ω		
V 7	6AL5	2.2Ω	0Ω	.7Ω	0Ω	1Meg	0Ω	6.8KΩ		
V 8	6AU6	6.8KΩ	0Ω	.1Ω	0Ω	†13KΩ	†9.2KΩ	0Ω		
V 9	6AU6	†45KΩ	†1KΩ	.1Ω	0Ω	100KΩ	▲1.2KΩ	† 1KΩ		
V 10	6C4	▲1.2KΩ	Inf.	0Ω	.1Ω	▲1.2KΩ	1Meg	12KΩ		
V 11	6K6GT	Inf.	0Ω	▲3KΩ	† 1KΩ	1Meg	Inf.	.1Ω	3.3KΩ	
V 12	6AU6	#16Ω	#14Ω	.1Ω	0Ω	▲2.2KΩ	▲2.2KΩ	# 95Ω		
V 13	6AU6	#470KΩ	#0Ω	.7Ω	0Ω	▲2.2KΩ	▲2.2KΩ	#82Ω		
V 14	6T8	Inf.	36KΩ	Inf.	0Ω	.1Ω	33KΩ	0Ω	10Meg	▲480KΩ
V 15	6V6GT	Inf.	.1Ω	▲1.9KΩ	▲9.4KΩ	500KΩ	▲1.2KΩ	0Ω	330Ω	
V 16	12AU7	†330KΩ	270KΩ	0Ω	0Ω	0Ω	† 2.8KΩ	† 300KΩ	1.8KΩ	.1Ω
V 17	6J5GT	0Ω	.1Ω	¶ 1Meg ¶ 2.5Meg	0Ω	1.9Meg 2.9Meg	Inf.	0Ω	0Ω	
V 18	6S4	Inf.	6.7KΩ 680Ω	2.2Meg	.1Ω	0Ω	2.2Meg	Inf.	Inf.	PIN 9 ¶ 4KΩ
V 19	6AL5	27KΩ	27KΩ	0Ω	.1Ω	2.6Meg	0Ω	2.6Meg		
V 20	12AU7	▲270KΩ	100KΩ	1.5KΩ	0Ω	0Ω	▲5.7KΩ	2.6Meg	1.5KΩ	.1Ω
V 21	6CD6G	Inf.	0Ω	220Ω	Inf.	470KΩ	470KΩ	.1Ω	▲13KΩ	TOP CAP ¶45Ω
V 22	6W4GT	50KΩ 0Ω	Inf.	400KΩ	Inf.	▲70Ω	Inf.	.1Ω	0Ω	
V 23	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP ¶ 420Ω
V 24	5U4G	†950Ω	50KΩ	Inf.	22Ω	Inf.	22Ω	Inf.	50KΩ	
V 25	6X5GT	Inf.	.1Ω	12Ω	▲0Ω	12Ω	Inf.	0Ω	20KΩ	
V 26	16RP4	0Ω	1.1Meg	PIN 10 ▲65Ω	PIN 40KΩ	11 70KΩ	PIN 12 .1Ω			

FOCUS CONTROL COUNTER CLOCKWISE
FUNCTION SWITCH IN "TV" POSITION
† MEASURED FROM PIN8 OF V25
▲ MEASURED FROM PIN 8 OF V24
¶ MEASURED FROM PIN 3 OF V22
# MEASURED FROM 120 VDC POINT.

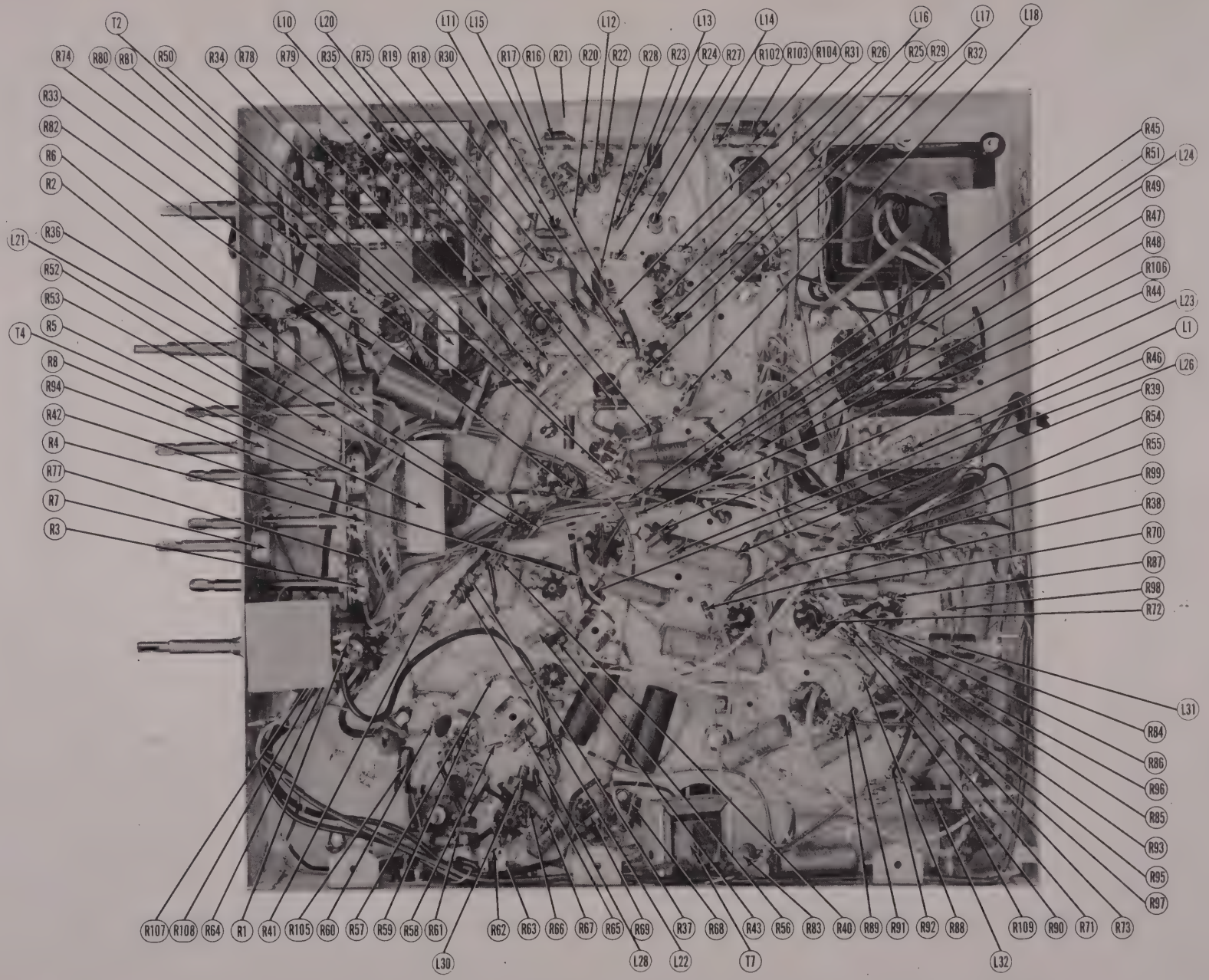
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



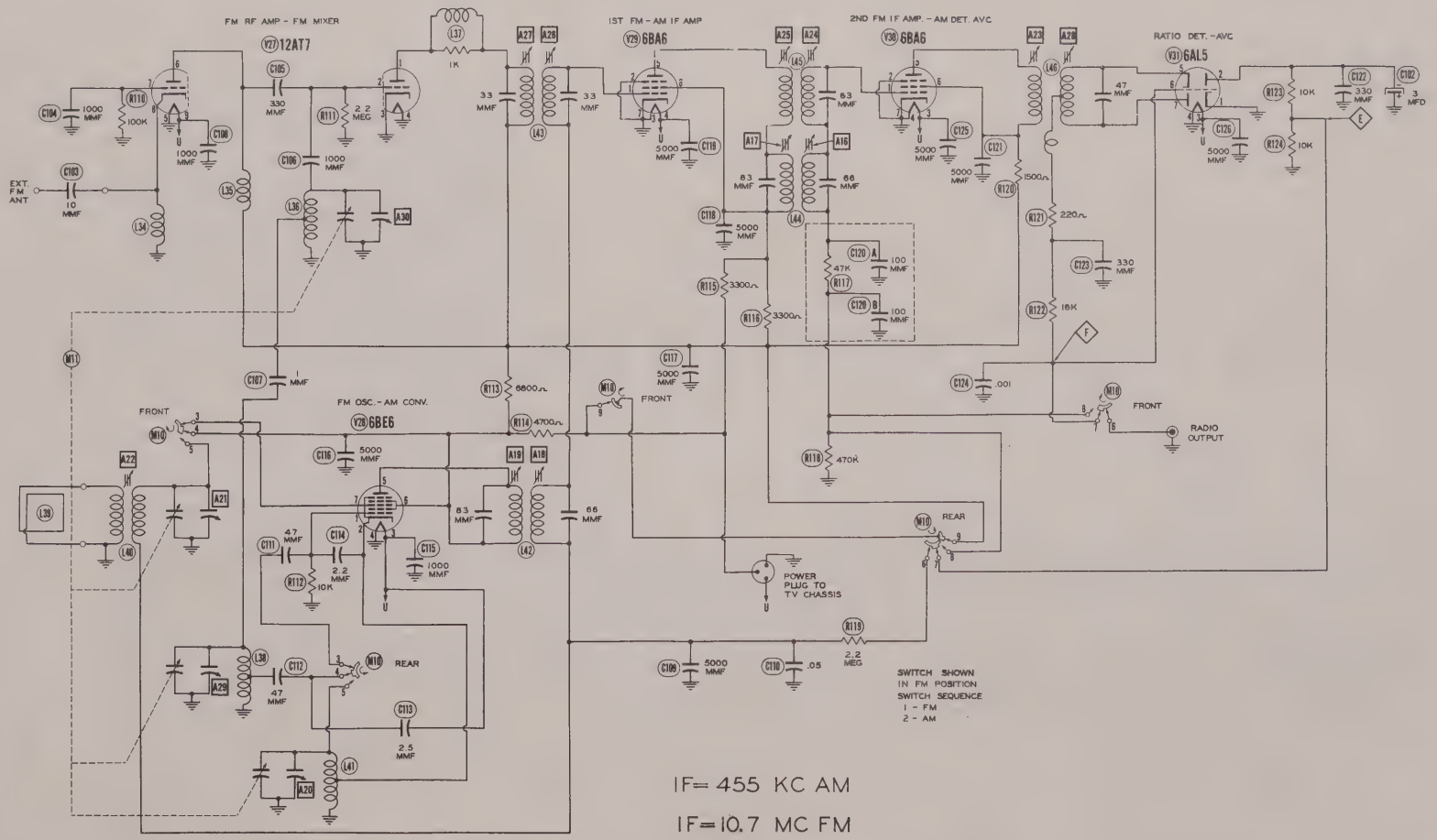
RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V27	12AT7	§140VDC	§-1.2VDC	0V	0V	0V	§140VDC	§-.9VDC	0V	6.3VAC
V28	6BE6	§§-3.1VDC ■§-5.7VDC	0V	6.3VAC	0V	§100VDC ■§105VDC	§100VDC ■§-.8VDC	§100VDC ■§-.8VDC		
V29	6BA6	§-.7VDC ■-.8VDC	0V	0V	6.3VAC	§ 105VDC ■ 100VDC	§ 105VDC ■§115VDC	0V		
V30	6BA6	-.4VDC	0V	6.3VAC	0V	§115VDC ■§75VDC	§115VDC ■§75VDC	0V		
V31	6AL5	0V	§-.5VDC	6.3VAC	0V	§-.2VDC	§-.1VDC	§-.3VDC		

§ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V27	12AT7	§† 1KΩ	2.2Meg	0Ω	0Ω	0Ω	†† 1KΩ	100KΩ	.5Ω	.1Ω
V28	6BE6	10KΩ	.9Ω	.1Ω	0Ω	§†† 4.2KΩ ■§† 4.7KΩ	§†† 4.2KΩ ■§† 4.7KΩ	§†† 4.2KΩ ■§2.7Meg		
V29	6BA6	§†2.2Meg ■2.7Meg	0Ω	0Ω	.1Ω	§†† 3.2KΩ ■§† 4.2KΩ	§†† 3.2KΩ ■§† 4.2KΩ	0Ω		
V30	6BA6	520KΩ	0Ω	.1Ω	0Ω	§†† 2.5KΩ ■§† 7KΩ	§†† 2.5KΩ ■§† 7KΩ	0Ω		
V31	6AL5	0Ω	20KΩ	.1Ω	0Ω	Inf.	Inf.	Inf.		

§ TAKEN IN FM POSITION
■ TAKEN IN AM POSITION

† MEASURED FROM PIN 8 OF V28

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SILVERTONE
MODEL 143A (Ch. 100.111)

RADIO SCHEMATIC

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		SILVERTONE PART No.	STANDARD REPLACEMENT		
V1A	RF Amp.	6AG5	6AG5	7BD	
B	RF Amp.	6CB6	6CB6	6CK	
V2	Converter	6J6	6J6	7BK	
V3	1st Video IF	6AU6	6AU6	7BK	
V4	2ndVideo IF	6AU6	6AU6	7BK	
V5	3rd Video IF	6AU6	6AU6	7BK	
V6	4th Video IF	6AU6	6AU6	7BK	
V7	Video Det.-DC Restorer	6AL5	6AL5	6BT	
V8	Video Amp.	6AU6	6AU6	7BK	
V9	Keyed AGC	6AU6	6AU6	7BK	
V10	Cathode Follower	6C4	6C4	6BG	
V11	Video Output	6K6GT	6K6GT	7S	
V12	1st Sound IF Amp.	6AU6	6AU6	7BK	
V13	2nd Sound IF Amp.	6AU6	6AU6	7BK	
V14	Ratio Det. -Dyn. Limiter-AF Amp.	6T8	6T8	9E	
V15	Audio Output	6V6GT	6V6GT	7AC	
V16	Sync. Sep-Phase Inverter	12AU7	12AU7	9A	
V17	Vert. Oscillator	6J5GT	6J5GT	6Q	
V18	Vert. Output	6S4	6S4	9AC	
V19	Horiz. Phase Det.	6AL5	6AL5	6BT	
V20	Horiz. Mult.	12AU7	12AU7	9A	
V21	Horiz. Output	6CD6G	6CD6G	5BT	
V22	Damper	6W4G	6W4G	4CG	
V23	HV Rectifier	1B3GT	1B3GT	3C	
V24	LV Rectifier	5U4G	5U4G	5T	
V25	LV Rectifier	6X5GT	6X5GT	6S	
V26A	Picture Tube	16RP4	16RP4	12D	
B	Picture Tube	16TP4	16TP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	450	W508072	AFH888J		UPT44445		TVL-3787	● Filter
B	40	450							■ Filter
C	40	450							▲ Filter
C2A	20	300	W508073	AFH1242G		UPT63130		TVL-2579	▲ Filter
B	60	300							◆ Filter
C3	40	300	W160095	PRS450/40		BR4035		TVA-1611	Filter
C4	4	150	W502547	PRS150/4		BR415		TVA-1402	Stabilizing Cap
C5	10	150	W505174	PRS150/12		BR1015		TVA-1406	Dyn. Limiter Cap
C6	4	450	W504719	PRS450/4		BR445		TVA-1702	Decoupling
C7	50	25	W502527	PRS25/25		BR502A		TVA-1206	Output Cath. Bypass
C8	10	600	W508680	PRS700/10		BRHV610		TVA-1902	Decoupling
C9	100	50	W508682	PRS50/100		BRH501		TVA-1310	Vert. Output Cath.
C10	5	50	W508684	PRS150/4		BR550		TVA-1303	Horiz. Output Cathode
C11	15		W508569	SI15	D6-150		GP1K-15	19C22	RF Coupling
C12	1.5			SI1.5NPO	TCZ-1.5		NPOK-1.5		Fixed Trimmer *
C13	500			BPD-00047	DD-471		GP2K-500	19C32	AGC Filter *
C14	500		W508570	BPD-00047	DD-471		GP2K-500	19C32	RF Amp. Dec. †
C15	470		W508572	SI470	D6-471		GP2K-470	19C15	RF Amp. Dec.
C16	.25		W508573						RF Coupling
C17	.5		W508574		TCZ-5				RF Coupling
C18	1.8		W508575						RF Coupling
C19	470		W508572	SI470	D6-471		GP2K-470	19C15	Mixer Grid Filter
C20	10		W508571	SI10NPO	TCZ-10			19C3	Osc. Grid Cap
C21	3		W508557				N080K-3		Osc. Feedback
C22	1.5		W508783	SI1.5NPO	TCZ-1.5		NPOK-1.5		Osc. Coupling
C23A	1000		W508576	BPD-2X001	DD-2-102		812-2X001	29C7	Conv. Fil. Bypass
B	1000								RF Bypass
C24	10		W508571	SI10NPO	TCZ-10		NPOK-10	19C3	Fixed Trimmer
C25	220		W513005	SI220	D6-221	5W5T25	GP2K-220	19C13	IF Coupling
C26	1000		W513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	AGC Filter
C27	1000		W513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	AGC Filter
C28	1000		W513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	1st V. IF Dec.
C29	240	500	W512532		TCZ-240				Fixed Trimmer
C30	1000		W513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	Filament Bypass
C31	1000		W513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	1st V. IF Fil.
C32	82		W513016	SI82	TCZ-82	5W5T1	GP1K-82	19C11	IF Coupling
C33	1000		W513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	AGC Coupling
C34	1000		W513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	2nd V. IF Dec.
C35	1000		W513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	2nd V. IF Fil.
C36	82		W513016	SI82	TCZ-82	5W5T1	GP1K-82	19C11	IF Coupling
C37	1000		W513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	AGC Filter
C38	1000		W513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	3rd V. IF Dec.
C39	1000		W513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	3rd V. IF Fil.
C40	240	500	W512532		TCZ-240				Fixed Trimmer
C41	82		W513016	SI82	TCZ-82	5W5T1	GP1K-82	19C11	IF Coupling
C42	.05	200	W512027	P288-05	DF-503	PTE4S5		2TM-S5	AGC Filter
C43	.25	200	W512045	P488-25		GT2P25		2TM-P25	AGC Filter
C44	1000		W513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	4th V. IF Dec.
C45	1000		W513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	4th V. IF Fil.
C46	5		W513432	SI5NPO	TCZ-4.7	5W5V5	NPOK-5	MS-55	V. Diode Filter
C47	5000		W513013	BPD-005	DD-502	1D5D5	811-005	29C1	V. Det.-DC Res. Fil.
C48	.25	200	W512045	P488-25		GT2P25		2TM-P25	V. Amp. Screen
C49	100		W513003	SI100	D6-101	5W5T1	GP1K-100	19C11	Peaking
C50	.1	200	W512033	P288-1		PTE4P1		2TM-P1	Video Coupling
C51	.05	200	W512027	P288-05	DF-503	PTE4S5		2TM-S5	Video Coupling
C52	.05	600	W512031	P688-05	DF-503	PTE6S5		6TM-S5	Video Coupling
C53	.05	600	W512031	P688-05	DF-503	PTE6S5		6TM-S5	Video Coupling
C54	.02	600	W512019	P688-02	DF-203	PTE6S2		6TM-S2	Vert. Sweep Coupling
C55	.05	600	W512031	P688-05	DF-503	PTE6S2		6TM-S5	Integrator Net
C56	2.2		W513001		TCZ-2.2				S. IF Coupling
C57	5000		W513013	BPD-005	DD-502	1D5D5	811-005	29C1	1st S. IF Dec.
C58	5000		W513013	BPD-005	DD-502	1D5D5	811-005	29C1	1st S. IF Dec.
C59	5000		W513013	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C60	220		W513018	SI220	D6-221	5W5T25	GP2K-220	19C13	RF Bypass
C61	47		W513433	SI47	D6-470	5W5Q5	GP1K-47	19C25	S. IF Coupling
C62	1000		W513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	1st S. IF Fil.

TV PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C83	5000		W513013	BPD-005	DD-502	ID5D5	811-005	29C1	2nd S. IF Fil.
C84	5000		W513013	BPD-005	DD-502	ID5D5	811-005	29C8	2nd S. IF Dec.
C85	1000		W513009	SII000	D6-102	1W5D1	GP2L-001	19C1	S. IF Coupling
C86	1500		W513010	SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C87	220	500	W512527	1468-00025	D6-221	5W5T25	GP2K-220	1FM-225	Diode Load Cap
C88	1500		W513010	SI1500	D6-152	1W5D15	GP2L-0015	29C8	De-emphasis
C89	.05	200	W512027	P288-05	DF-503	PTE4S5		2TM-S5	Audio Coupling
C70	.005	600	W512007	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Tone Comp.
C71	.005	600	W512007	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling
C72	270		W513006	SI270	D6-271	5W5T25	GP2K-270	19C31	AF Amp. Plate
C73	.005	600	W512007	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling
C74	.01	600	W512013	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Tone Comp.
C75	.002	600	W512003	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	Output Plate Bypass
C76	.25	200	W512045	P488-25		GT2P25		2TM-P25	Sync. Coupling
C77A	10000		TW508062	P688-01		PTE6S1	821-01	6TM-S1	Vert. Sync. Coupling
B	2000			P688-002	† PC-101	PTE6D2	GP2M-002	6TM-D2	Integrator Net
C	5000			P688-005		PTE6D5	811-005	6TM-D5	Integrator Net
D	5000			P688-005		PTE6D5	811-005	6TM-D5	Integrator Net
C78	4700	1000	W512533						Vert. Osc. Grid
C79	.1	600	W512037	P688-1		PTE6P1		6TM-P1	Vert. Sweep Coupling
C80	.05	600	W512308	P688-05		PTE6S5		6TM-S5	Vert. Discharge
C81	1000		W513009	SII000	D6-102	1W5D1	GP2L-001	19C1	Horiz. Sync. Coupling
C82	1000		W513009	SII000	D6-102	1W5D1	GP2L-001	19C1	Horiz. Sync. Coupling
C83	.01	600	W512013	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Voltage Divider
C84	.05	600	W512031	P688-05	DF-503	PTE6S5		6TM-S5	Horiz. Feedback
C85	5000		W513013	BPD-005	DD-502	ID5D5	811-005	29C1	AFC Filter
C86	.05	200	W512027	P288-05	DF-503	PTE4S5		2TM-S5	AFC Filter
C87	330		W513007	SI330-	D6-331	5R5T3	GP2K-330	19C14	Horiz. MV Feedback
C88	3300	500	W512531						Fixed Trimmer
C89	390	500	W512535	1469-0004	D6-391	5R5T4	GP2K-390	MS-34	Horiz. Discharge
C90	270	500	W512536	1469-00025	D6-271	5R5T25	GP2K-270	MS-325	Horiz. Sweep Coupling
C91	.05	600	W512031	P688-05	DF-503	PTE6S5		6TM-S5	Horiz. Output Screen
C93	.1	600	W512037	P688-1	DF-104	PTE6P1		6TM-P1	Horiz. Sweep Coupling
C93	.05	600	W512031	P688-05		PTE6S5		6TM-S5	Damper Filter
C94	.05	600	W512031	P688-05		PTE6S5		6TM-S5	Damper Filter
C95	3.3	1500	W512538						Horiz. Feedback
C96	3.3	1500	W512538						Horiz. Feedback *
C97	3.3	1500	W512538						Horiz. Feedback *
C98	3.3	1500	W512538						Horiz. Feedback *
C99	500	20000	W513024	HV20B	TV1-502				H. V. Filter
C100	.01	400	W512255	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Line Filter
C101	.01	400	W512255	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Line Filter

* Not Used In All Models.
† Items C77A, C77B, C77C, C77D, R74A, R74B, And R74C Are Combined Into One Unit.
† Some Models Use 680MMF In This Application.

CONTROLS

ITEM No.	RATING RESIST.	RATING WATTS	SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1Meg	½	508182	Q13-137X	AK-98	ANT-73	Volume control - tapped ② 250KΩ
B	Shaft		Not req.	RQ	FKS-1/4	AK-1	Attach to R1A per instructions
C	Switch		Not req.	76-1	SWB	K-155	Attach to R1A per instructions
R2A	3000Ω	4	508457		RTV-222		Contrast control - panel - wire wound
B	500KΩ	½					Tone control - rear
R3A	9000Ω	½	508453		AM-23-S	AN-13	Vert. linearity control
B	Shaft		Not req.		KSS-5	AK-16 *	Attach to R3A per instructions
						AK-3	
R4A	1Meg	½	508054	Q11-137	AG-61-S	B-69	Vert. hold control
B	Shaft		Not req.	C3 *	KSS-5	AK-16 *	Attach to R4A per instructions
R5A	2.5Meg	½	508455	Q11-239	AG-84-S	B-83½	Height control
B	Shaft		Not REq.	C3 *	KSS-5	AK-16 *	Attach to R5A per instructions
R6	5500Ω	4	508456		RTV-221		Focus control
R7A	50KΩ	½	508056	Q11-123	AG-44-S	AN-31	Horiz. hold control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R7A per instructions
R8A	50KΩ	½	508056	Q11-123	AG-44-S	AN-31	Brightness control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R8A per instructions

* Use this coupler with original shaft to obtain desired length.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	SILVERTONE PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE STATED
R9	4700Ω	½	W510148	BTS-4700	Antenna Coil Shunt - See Note 1
R10	2200Ω 20%	½	W510143	BTS-2200	AGC Filter Network
R11	2200Ω	½	W510142	BTS-2200	RF Amp. Decoup
R12	220KΩ	½			RF Coil Shunt - See Note 2
R13	15KΩ 20%	½	W510158		Mixer Plate
R14	22KΩ 20%	½	W510161		Osc. Grid
R15	4700Ω	½	W510148	BTS-4700	Osc. Plate
R16	1000Ω 20%	½	W510137	BTS-1000	AGC Network
R17	4700Ω	½	W510148	BTS-4700	1st Video IF Amp. Grid
R18	150Ω 20%	½	W510122	BTS-150	1st Video IF Amp. Cathode
R19	1500Ω 20%	½	W510140	BTS-1500	1st Video IF Trap Coil Shunt
R20	1000Ω 20%	½	W510137	BTS-1000	1st Video IF Amp. Decoup
R21	1000Ω 20%	½	W510137	BTS-1000	AGC Network
R22	8200Ω	½	W510153		2nd Video IF Amp. Grid
R23	100Ω 20%	½	W510119	BTS-100	2nd Video IF Amp. Cathode
R24	1000Ω 20%	½	W510137	BTS-1000	2nd Video IF Amp. Decoup
R25	1000Ω 20%	½	W510137	BTS-1000	AGC Network
R26	4700Ω	½	W510148	BTS-4700	3rd Video IF Amp. Grid
R27	120Ω	½	W510120	BTS-120	3rd Video IF Amp. Cathode
R28	1000Ω 20%	½	W510137	BTS-1000	3rd Video IF Amp. Decoup
R29	8200Ω	½	W510153		3rd Video IF Transformer Shunt
R30	100Ω 20%	½	W510119	BTS-100	4th Video IF Amp. Cathode
R31	1000Ω 20%	½	W510137	BTS-1000	4th Video IF Amp. Decoup
R32	8200Ω	½	W510153		4th Video IF Transformer Shunt
R33	6800Ω	½	W510151	BTS-6800	Video Det. Diode Load
R34	10K	1	W510254	BTA-10K	Voltage Divider
R35	8200Ω	½	W510253	BTA-8200	Video Amp. Screen
R36	47KΩ	½	W510166	BTS-47K	Video Peaking Coil Shunt
R37	33KΩ 20%	½	W510164	BTS-33K	Keyed AGC Grid
R38	100KΩ 20%	½	W510173	BTS-100K	AGC Network
R39	10KΩ 20%	½	W510155	BTS-10K	AGC Network
R40	5600Ω	½	W510150	BTS-5600	Video Peaking
R41	5600Ω	½	W510150	BTS-5600	Video Amp. Plate

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	SILVERTONE PART No.	IRC PART No.	IDENTIFICATION CODES
R42	1Meg 20%	½	W510191	BTS-1Meg	Cathode Follower Grid
R43	12KΩ	2	W510356	BTB-12K	Cathode Follower Cathode
R44	1Meg 20%	½	W510191	BTS-1Meg	Video Output Grid
R45	270Ω	½	W510126	BTS-270	Video Output Cathode
R46	12KΩ 5%	½	W510723	BTS-12K-5%	Video Peaking Coil Shunt
R47	1500Ω	2	W510339	BTB-1500	Video Output Plate
R48	1500Ω	2	W510339	BTB-1500	Video Output Plate
R49	12KΩ	½	W510156	BTS-12K	Isolation
R50	1Meg 20%	½	W510191	BTS-1Meg	DC Restorer Diode Load
R51	100KΩ 20%	½	W510173	BTS-100K	Picture Tube Grid
R52	82KΩ	½	W510171	BTS-82K	Voltage Divider
R53	15KΩ	½	W510157	BTS-15K	Voltage Divider
R54	22KΩ 20%	½	W510161	BTS-22K	Voltage Divider
R55	2200Ω 20%	½	W510143	BTS-2200	Blanking Network
R56	82Ω	½	W510117	BTS-82	1st Sound IF Amp. Cathode
R57	1000Ω 20%	½	W510137	BTS-1000	1st Sound IF Amp. Decoup
R58	470KΩ 20%	½	W510185		2nd Sound IF Amp. Grid Lear
R59	82Ω	½	W510117	BTS-82	2nd Sound IF Amp.Cathode
R60	1000Ω 20%	½	W510137	BTS-1000	2nd Sound IF Amp. Decoup
R61	22KΩ	½	W510160	BTS-22K	De-emphasis
R62	18KΩ	½	W510159	BTS-18K	Ratio Det. Diode Load
R63	18KΩ	½	W510159	BTS-18K	Ratio Det. Diode Load
R64	68KΩ 20%	½	W510170	BTS-68K	Tone Compensation
R65	33KΩ 20%	½	W510164	BTS-33K	Dyn. Limiter Load
R66	10Meg 20%	½	W510197	BTS-10Meg	AF Amp. Grid
R67	470KΩ 20%	½	W510185	BTS-470K	AF Amp. Plate
R68	330Ω	1	W510227	BTA-330	Sound Output Cathode
R69	8200Ω	½	W510153	BTS-8200	Decoup
R70	270KΩ	½	W510180	BTS-270K	Sync. Sep. Grid
R71	330KΩ	½	W510181	BTS-330K	Sync. Sep. Plate
R72	1800Ω 5%	½	W510739	BTS-1800-5%	Phase Inverter Cathode
R73	1800Ω 5%	½	W510739	BTS-1800-5%	Phase Inverter Plate
R74A	32KΩ	½			Integrator
B	8200Ω		† W508062		Integrator
C	8200Ω				Integrator
R75	1.5Meg 5%	½		BTS-1.5Meg-5%	Vert. Osc. Grid - See Note 3
R76	1Meg	½	W510190	BTS-1Meg	Vert. Hold Control Shunt - See Note 1
R77	100KΩ	½	W510172	BTS-100K	Voltage Divider
R78	6.8Meg 20%	½	W510196	BTS-6.8Meg	Voltage Divider
R79	1.2Meg	½	W510738	BTS-1.2Meg	Vert. Osc. Plate
R80	6800Ω	½	W510151	BTS-6800	Vert. Peaking
R81	2.2Meg 20%	½	W510193	BTS-2.2Meg	Vert. Output Grid
R82	680Ω	½		BTS-680	Vert. Output Cathode
R83	3000Ω 5%	2	W510713		Vert. Output Plate Decoup
R84	100KΩ	½	W510172	BTS-100K	Horiz. Phase Det. Diode Load
R85	100KΩ	½	W510172	BTS-100K	Horiz. Phase Det. Diode Load
R86	4.7Meg 20%	½	W510195	BTS-4.7Meg	Horiz. Phase Det. Diode Load
R87	27KΩ	½	W510162	BTS-27K	Feedback Network
R88	470KΩ 20%	½	W510185	BTS-470K	Horiz. AFC Filter
R89	4.7Meg 20%	½	W510195	BTS-4.7Meg	Horiz. MV Grid
R90	5600Ω	½	W510150	BTS-5600	Horiz. MV Plate
R91	1500Ω	½	W510139	BTS-1500	Horiz. MV Cathode
R92	100KΩ	½	W510172	BTS-100K	Horiz. MV Grid
R93	270KΩ	½	W510180	BTS-270K	Horiz. MV Plate
R94	680KΩ	½	W510187	BTS-680K	Voltage Divider
R95	68Ω 20%	½	W510116		Parasitic Supp
R96	470KΩ	½	W510184	BTS-470K	Horiz. Output Grid
R97	220Ω	5	W510716	1 3/4A-225	Horiz. Output Cathode - Wire Wound
R98	12KΩ	2	W510356	BTB-12K	Horiz. Output Grid
R99	10KΩ	1	W510254	BTA-10K	Horiz. Feedback
R100	3.3Ω	½	W510725		HV Rectifier Filament
R101	1Meg	2	W510391		HV Filter
R102	560Ω	2	W510332	BTB-560	Focus Coil Shunt
R103	100Ω 20%	2	W510319	BTB-100	Filter
R104	850Ω	5	W510726	1 3/4A-800	Filter - Wire Wound
R105	7500Ω	5	W510727	1 3/4A-7500	Voltage Divider - Wire Wound
R106	600Ω	10	W510741	1 3/4A-600	Filter - Wire Wound
R107	3.3Ω	½	W510725	BW-½-3.3	AM Indicator Lamp Dropping
R108	3.3Ω	½	W510725	BW-½-3.3	FM Indicator Lamp Dropping
R109	220KΩ 20%	½	W510179	BTS-220K	Isolation

† Items R74A, R74B, R74C, C77A, C77B, And C77C Are Combined Into One Unit.
Note 1. Not Used In All Models.
Note 2. Some Models Use 270KΩ Resistor In This Application.
Note 3. Some Models Use 1.8Meg Resistor In This Application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ② 2.2A	720VCT .260ADC & 360VCT .057ADC	5VAC ③ 3A	6.3VAC ② 11.8A	W-508702			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	120Ω	120Ω	W508076	A-8111 ①	A-3037	TBO-1 ①	Vert. Block Osc. Trans.
T3	415Ω Tapped ② 43Ω	7.8Ω Tapped ② 5.4Ω SEC. 2 0Ω	W508679		HVO-6		Horiz. Output Trans.
T4	1300Ω Tapped ② 14Ω		W508674	A-8112	A-3036	TSO-5 ①	Vert. Output Trans.
T5A	13Ω		W508675	DY-7			Horiz. Deflection Coil
B	50Ω						Vert. Deflection Coil
T6	1300Ω		W508861				Focus Coil

① Drill one new mtg. hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T7	5.9KΩ	4.1Ω	660Ω	.8Ω	W505912	A-3823	A-3019	RO-303	

SPEAKER

ITEM No.	RATINGS		SILVERTONE PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.		ST-810		
SP1	PM	4.1Ω	W508174	MOD. P69-V	69A2	
	CONE DIA.	V. C. DIA.				
SP2	6"X 9"	3/4"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.280A	65Ω	2.7 Henries	W508341	C-2326 ①	C-2996	TR-3300①	① Drill one new mtg. hole

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	SILVERTONE PART No.	MEISSNER PART No.	IRC PART No.	NOTES
L2	Antenna Coil	.2Ω	.1Ω	W508553			
L3	Antenna Coil	.2Ω	.1Ω	W508552			
L4	Fil. Choke	.2Ω		W507587		CLA	4.7 Microhenries
L5	RF Coil	0Ω		W508554			
L6	Mixer Grid Coil	0Ω					Part of tuner part number W508431
L7	Osc. Coil	0Ω		W508558			Channel 6
L8	Osc. Coil	0Ω		W508560			Channel 13
L9	1st Video IF	.6Ω		W508555			Includes slug
L10	Fil. Choke	0Ω		W507584			
L11	Cathode Choke Trap	0Ω		W507587			
L12	2nd Video IF	.1Ω		W507343			Less slug
L13	Fil. Choke	0Ω		W507584			
L14	3rd Video IF	.1Ω		W507343			Less slug
L15	Cathode Choke Trap	0Ω		W507587			
L16	4th Video IF	.1Ω		W507343			Less slug
L17	Grid Choke	3Ω		W507367			
L18	Fil. Choke	.2Ω		W507587		CLA	4.7 Microhenries
L19	5th Video IF	.1Ω	2.2Ω	W507591			
L20	Fil. Choke	.5Ω		W507586		CLA	1 Microhenry
L21	Peaking	22Ω		W507374			
L22	Peaking	22Ω		W507374			
L23	Peaking	4.3Ω		W508069			Green dot
L24	Peaking	4.8Ω		W508070			Blue dot
L25	1st Sound IF	1.9Ω	1.9Ω	W508061			
L26	RF Choke	14Ω		W507373			
L27	2nd Sound IF	1.9Ω	1.9Ω	W508061			
L28	Fil. Choke	.5Ω		W507586		CLA	1 Microhenry
L29	Ratio Det. Trans.	5.2Ω	.1Ω	W507321			" "
L30	RF Choke	14Ω		W507373			
L31	Horiz. Locking Coil	67Ω		W508077			Less slug
L32	Horiz. Lin.	3.7Ω		W162190			
L33	Width Coil	4.4Ω	34Ω	W508667			Includes slug

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	SILVERTONE PART No.	NOTES
M1	Bayonet	6-8	.15	Brown	W118921	Type #47 on-off indicator
M2	Bayonet	6-8	.15	Brown	W118921	Type #47 TV indicator
M3	Bayonet	6-8	.15	Brown	W118921	Type #47 AM indicator
M4	Bayonet	6-8	.15	Brown	W118921	Type #47 FM indicator

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M5	RF Tuner	W508431	Complete with tubes
M6	Fuse	W508713	.25 250V type 3AG
M7	Switch	W508458	Function TV-Phono-AM-FM includes volume control
M8	Ion Trap	W508803	
B2	Trimmer	W508071	Horiz. drive 10-160MMF
	Safety Glass	W508719	
	Escutcheon	W508772	Channel selector
	Escutcheon	W508773	AM-FM dial scale
	Knob	W507895	Channel selector
	Knob	W507894	Fine tuning
	Knob	W508475	Brightness, horiz. hold
	Knob	W508476	Contrast
	Knob	W508474	Volume
	Knob	W508477	Tone
	Knob	W508473	Function switch
	Knob	W502563	Antenna

PHONO CARTRIDGE and NEEDLE

ITEM No.	SILVERTONE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	REMARKS
M9	W509160	GC-AG-J	G-AG			

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED.

RADIO PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		SILVERTONE PART No.	STANDARD REPLACEMENT		
V27	FM RF Amp.-FM Mixer	12AT7	12AT7	9A	
V28	FM Osc.-AM Conv.	6BE6	6BE6	7CH	
V29	1st FM-AM IF Amp.	6BA6	6BA6	7BK	
V30	2nd FM IF Amp.-AM Det.-AVC	6BA6	6BA6	7BK	
V31	Ratio Det.-AVC	6AL5	6AL5	6BT	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C102	3	50	W507946	PRS150/4		BR415		TVA-1303	Stabilizing Cap
C103	10		W513023	SI10	D6-100	5W5Q1	GP1K-10	19C19	Ant. Coupling
C104	1000		W513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	FM RF Amp. Grid
C105	330		W513007	SI330	D6-331	5W5T3	GP2K-330	19C14	RF Coupling
C106	1000		W513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	RF Coupling
C107	1		W513000		TCZ-1				Osc. Coupling
C108	1000		W513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	FM RF-Mixer Fil.
C109	5000		W513013	BPD-005	DD-502	1D5D5	811-005	29C1	AVC Filter
C110	.05	400	W512028	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C111	47		W513002	SI47	D6-470	5W5Q5	GP1K-47	19C25	Osc. Grid Cap
C112	47		W513002	SI47	D6-470	5W5Q5	GP1K-47	19C25	Osc. Grid Cap
C113	2.5		W513436						Osc. Feedback
C114	2.2		W513001		TCZ-2.2				Osc. Feedback
C115	1000		W513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	Conv. Fil. Bypass
C116	5000		W513013	BPD-005	DD-502	1D5D5	811-005	29C1	Decoupling
C117	5000		W513013	BPD-005	DD-502	1D5D5	811-005	29C1	Decoupling
C118	5000		W513013	BPD-005	DD-502	1D5D5	811-005	29C1	1st IF Decoupling
C119	5000		W513013	BPD-005	DD-502	1D5D5	811-005	29C1	1st IF Fil.
C120A	100		* W506338	SI100	*PC-50	5W5T1	GP1K-100	19C11	Diode RF Filter
B	100			SI100		5W5T1	GP1K-100	19C11	Diode RF Filter
C121	5000		W513013	BPD-005	DD-502	1D5D5	811-005	29C1	2nd IF Dec.
C122	330		W513007	SI330	D6-331	5W5T3	GP2K-330	19C14	RF Bypass
C123	330		W513007	SI330	D6-331	5W5T3	GP2K-330	19C14	Diode Load Cap
C124	.001	400	W512103	P488-001	D6-102	PTE6D1	GP2L-001	6TM-D1	De-emphasis
C125	5000		W513013	BPD-005	DD-502	1D5D5	811-005	29C1	2nd IF Fil.
C126	5000		W513013	BPD-005	DD-502	1D5D5	811-005	29C1	Ratio Det. Fil.

* Items C120A, C120B, And R117 Are Combined Into One Unit.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	SILVERTONE PART No.	IRC PART No.	
R110	100KΩ	1/2	W510173		RF Amp. Grid
R111	2.2Meg	1/2	W510193		FM Mixer Grid
R112	10KΩ	1/2	W510155		FM Osc. Grid
R113	6800Ω	1/2	W510152	BTS-6800	Decoup
R114	4700Ω	1	W510148	BTA-4700	Decoup
R115	3300Ω	1/2	W510146	BTS-3300	1st IF Amp. Decoup
R116	3300Ω	1	W510246	BTA-3300	Voltage Divider
R117	47KΩ	1/2	⊗ W506338	BTS-47K	Diode Filter
R118	470KΩ	1/2	W510185	BTS-470K	AVC Network
R119	2.2Meg	1/2	W510193	BTS-2.2Meg	AVC Network
R120	1500Ω	1	W510240	BTA-1500	IF Amp. Decoupling
R121	220Ω	1/2	W510125	BTS-220	Balancing
R122	18KΩ	1/2	W510159	BTS-18K	De-emphasis
R123	10KΩ	1/2	W510155	BTS-10K	Ratio Det. Diode Load
R124	10KΩ	1/2	W510155	BTS-10K	Ratio Det. Diode Load

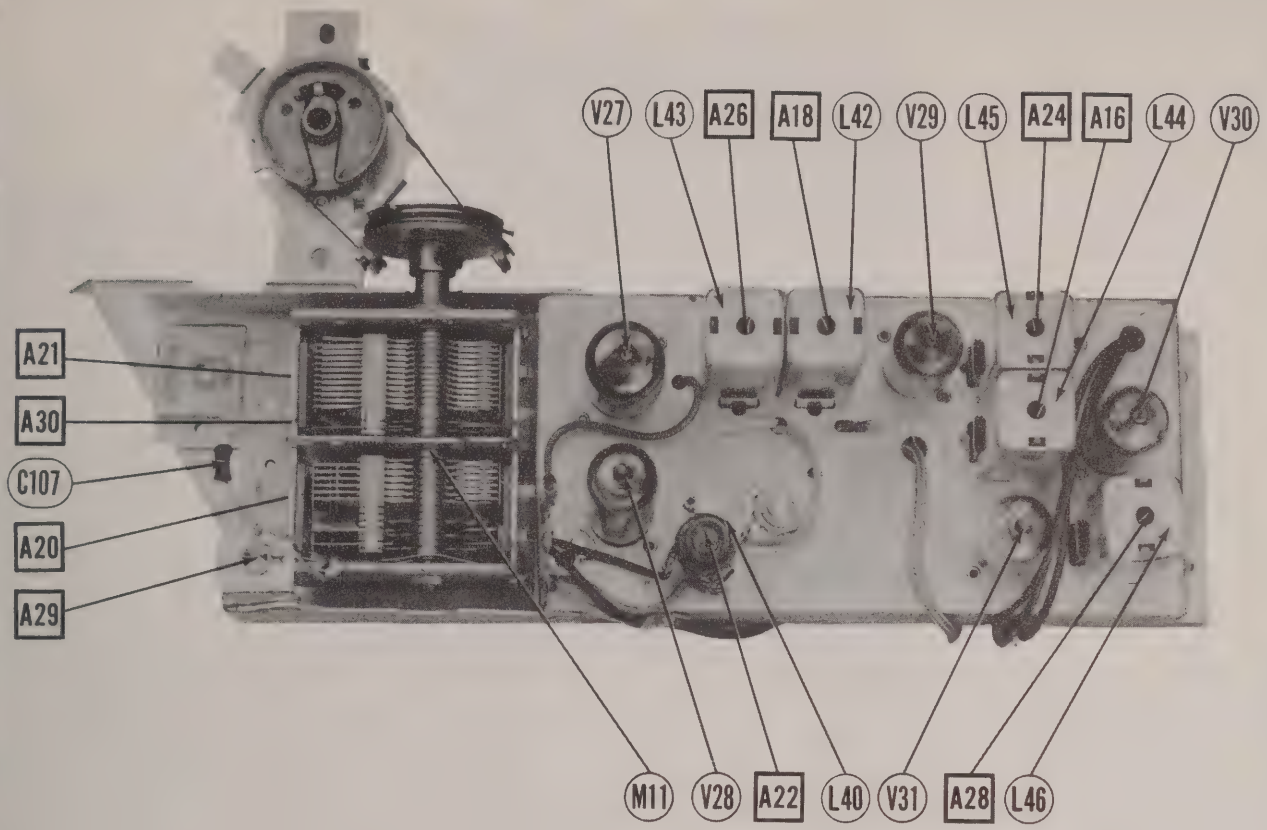
⊗ Items R117, C120A, And C120B Are Combined Into One Unit.

COILS (RF-IF)

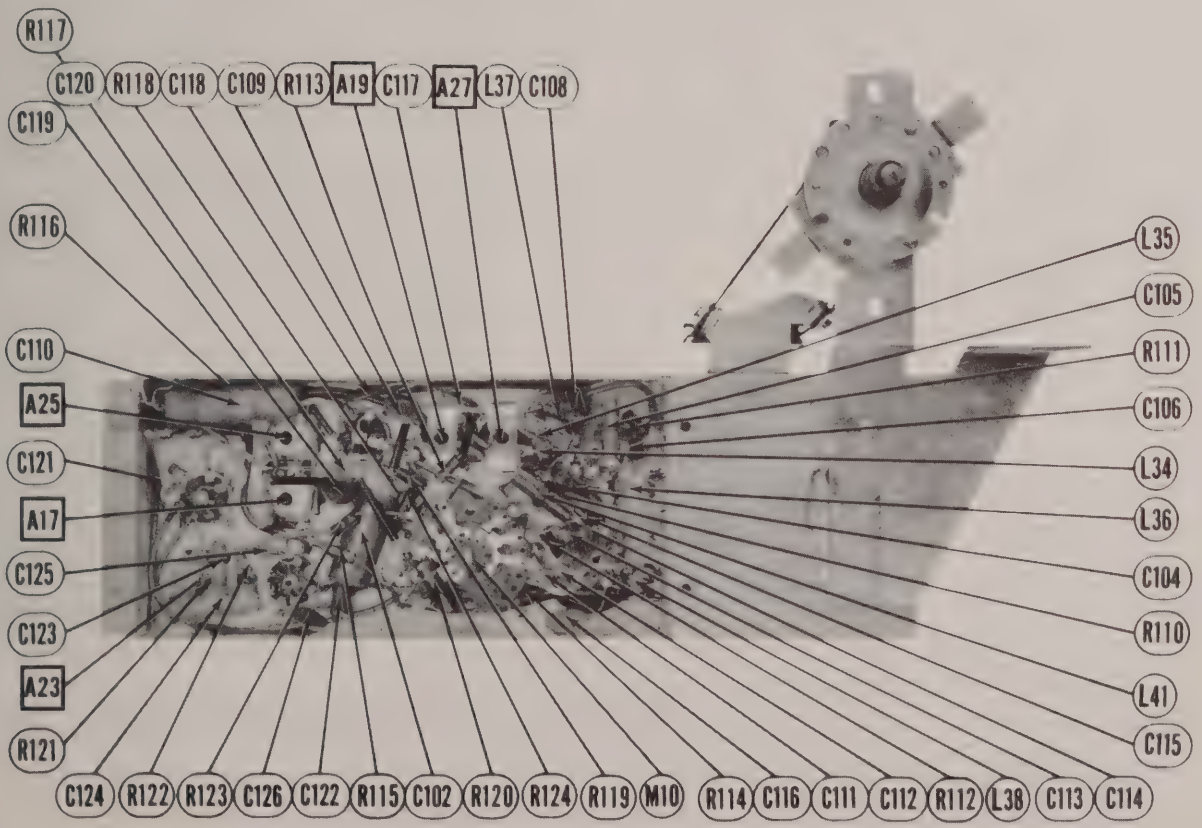
ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	SILVERTONE PART No.	MEISSNER PART No.	IRC PART No.	
L34	FM Ant. Coil	.5Ω		W507586		CLA	1 Microhenry
L35	RF Choke	2.7Ω		W507935		CLA	3.3 Microhenries
L36	FM RF Coil	0Ω		W507941			
L37	Parasitic Supp.	0Ω		W506581			Wound on 1KΩ resistor
L38	FM Osc. Coil	0Ω		W507942			
L39	Loop Antenna	.9Ω		W508212			
L40	AM Ant. Coil	.3Ω	2.3Ω	W508184			
L41	AM Osc. Coil	7.7Ω		W508195	14-1074		Tap at .9Ω
L42	1st AM IF	20Ω	20Ω	W505867	16-6758		
L43	1st FM IF	.5Ω	.5Ω	W506080	16-3487		
L44	2nd AM IF	20Ω	20Ω	W505867	16-6758		
L45	2nd FM IF	1.5Ω	.5Ω	W505905	16-3487		
L46	Ratio Det. Trans.	.9Ω	1.7Ω	W508179			

MISCELLANEOUS

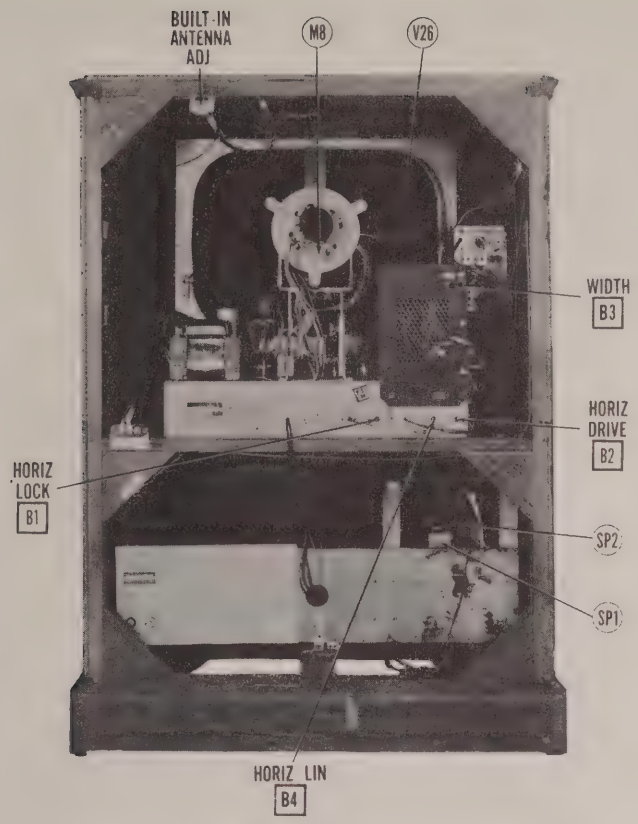
ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M10	Switch	W508753	Function
M11	Tuning Cap	W508729	AM-FM Tuning
	Knob	W508472	AM-FM fine tuning
	Knob	W508471	AM-FM pointer and course tuning



RADIO CHASSIS-TOP VIEW



RADIO CHASSIS-BOTTOM VIEW



CABINET-REAR VIEW

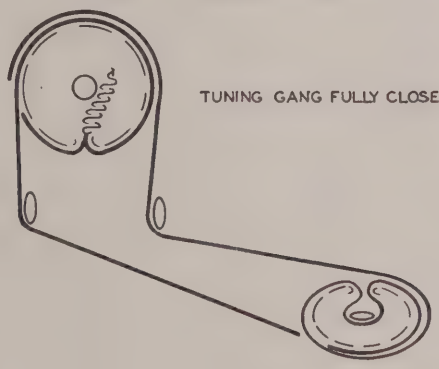
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.
Turn the horizontal hold control to mid-position of its range.
Adjust the horizontal lock slug (B1) until the picture synchronizes horizontally.
Adjust the horizontal drive trimmer (B2) clockwise just far enough to remove any vertical lines that may appear near the left side of the picture.
Adjust the width slug (B3) until the picture fills the mask horizontally.
Adjust the horizontal linearity slug (B4) until the picture is symmetrical from left to right. Slight readjustment of (B2) may be necessary to obtain optimum results.

DISASSEMBLY INSTRUCTIONS

1. Remove ten push-on type control knobs.
2. Remove nine wood screws holding rear cover in place. Remove rear cover.
3. Disconnect phono lead.
4. Disconnect built in antenna.
5. Remove antenna terminal strip.
6. Disconnect speaker leads.
7. Remove four 5/16" hex head bolts holding chassis in cabinet. Remove chassis.
8. Remove four 5/16" hex nuts holding speaker to cabinet. Remove speaker.

Note: FOR PICTURE TUBE REMOVAL , IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.



DIAL CORD STRINGING

PHOTOFACT* Folder

*TRADE MARK

SPARTON MODELS
5006X, 5007X (CH.25TK10A)

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MODEL 5006X

SPARTON MODELS
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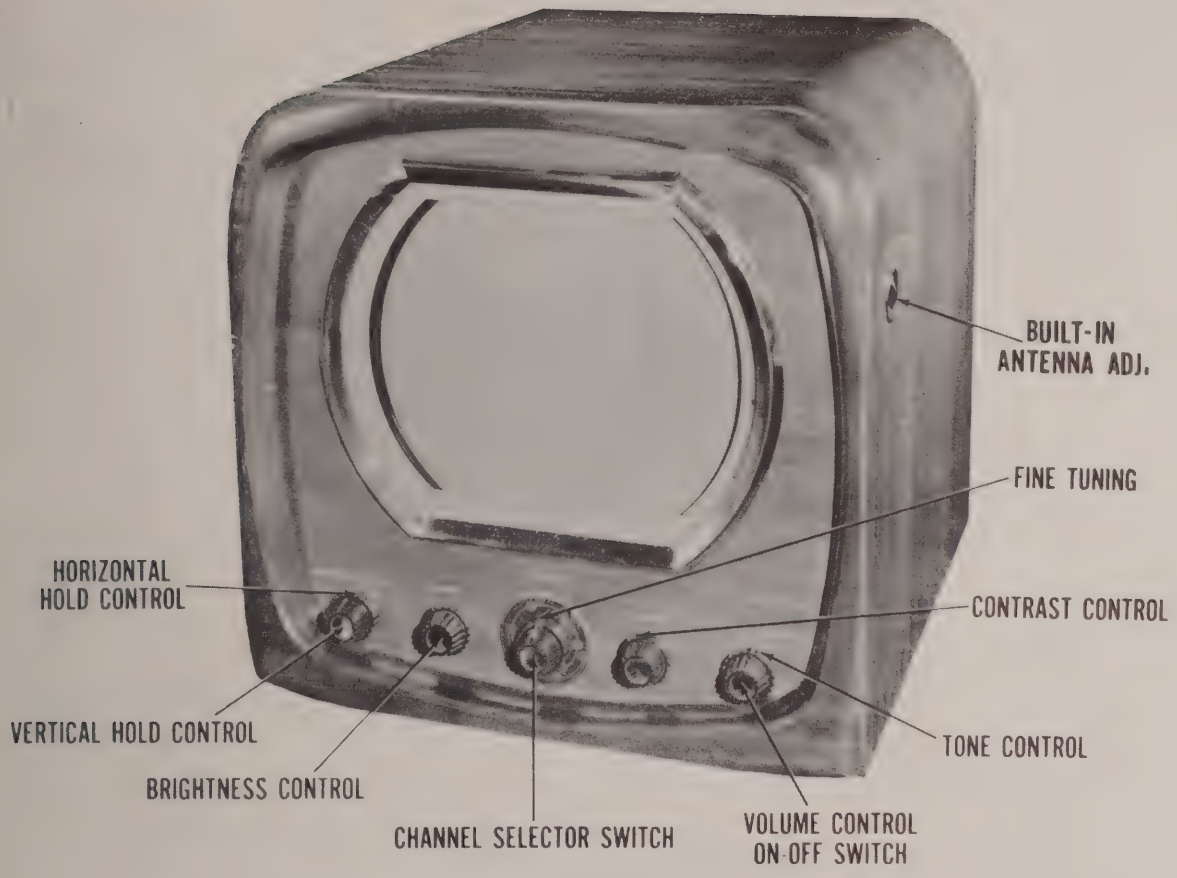

SPARTON
MODELS 5006X, 5007X

SPARTON MODEL 5006X

TRADE NAME	Sparton Models 5006X, 5007X (Ch. 25TK10A)
MANUFACTURER	Sparks - Withington Co., Jackson, Michigan
TYPE SET	Television Receiver
TUBES	Twenty Five
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	1.8 Amp. @ 117 Volts AC
TUNING RANGE—Channels 2 thru 13	

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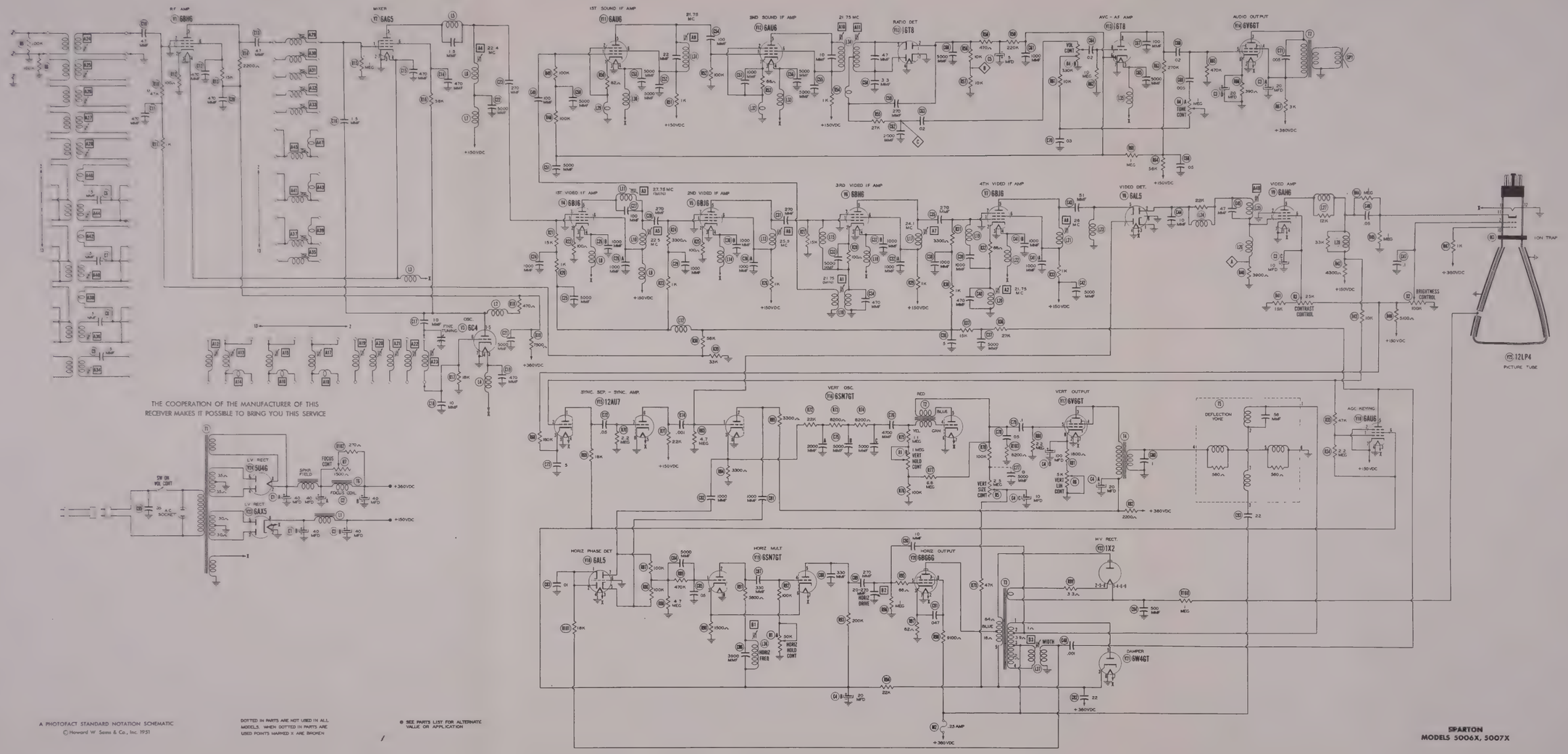

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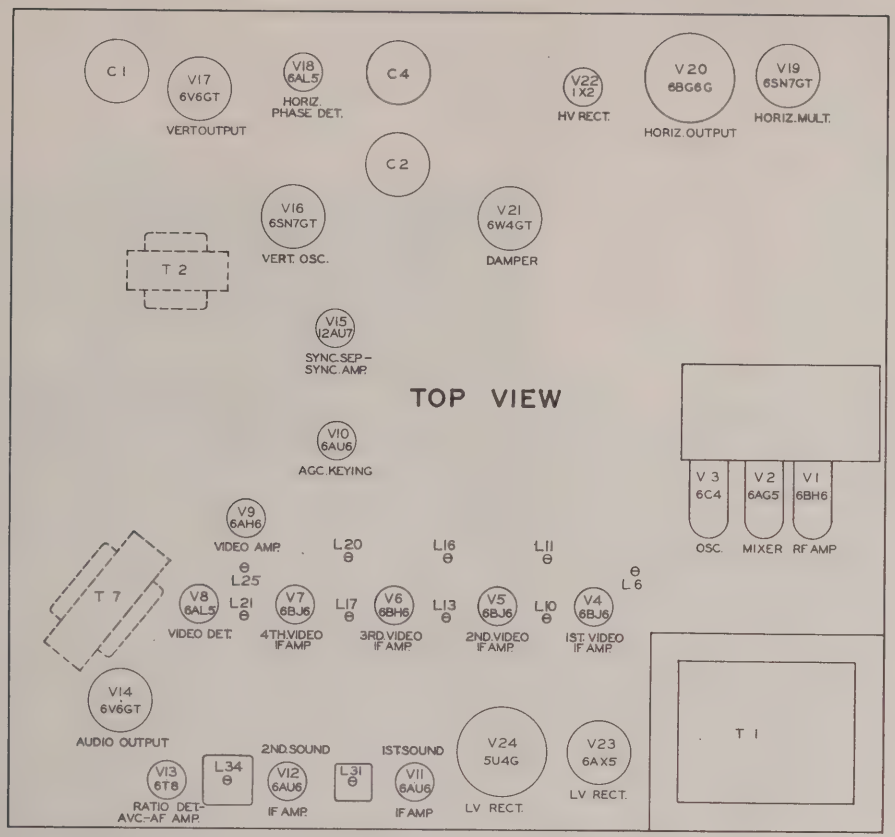
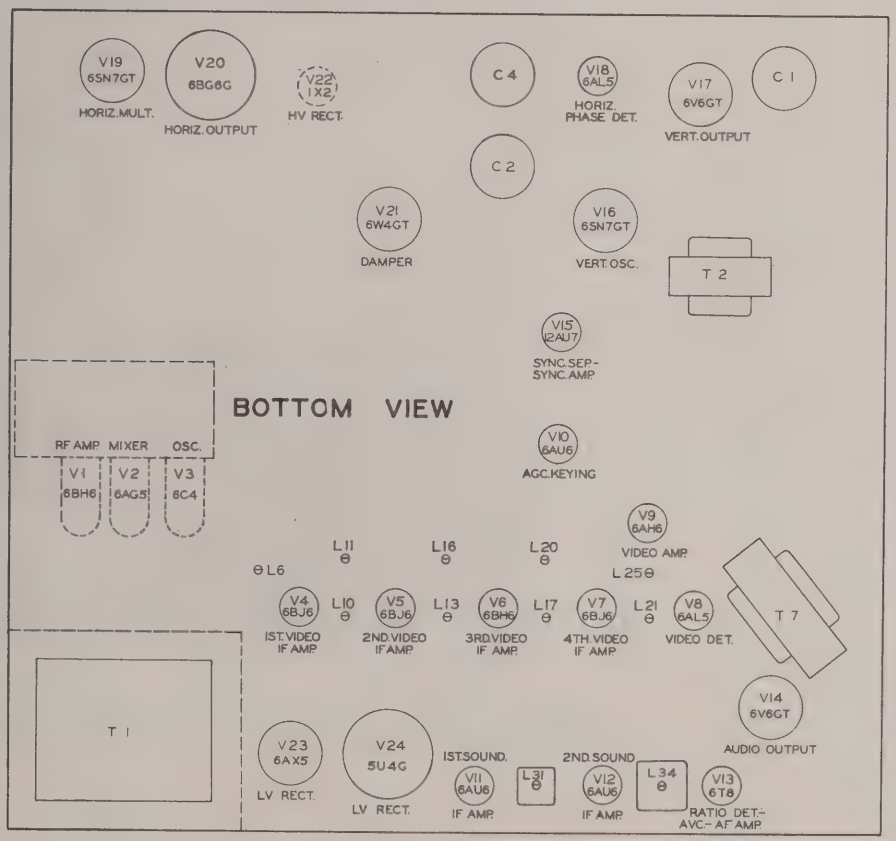
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN

* SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

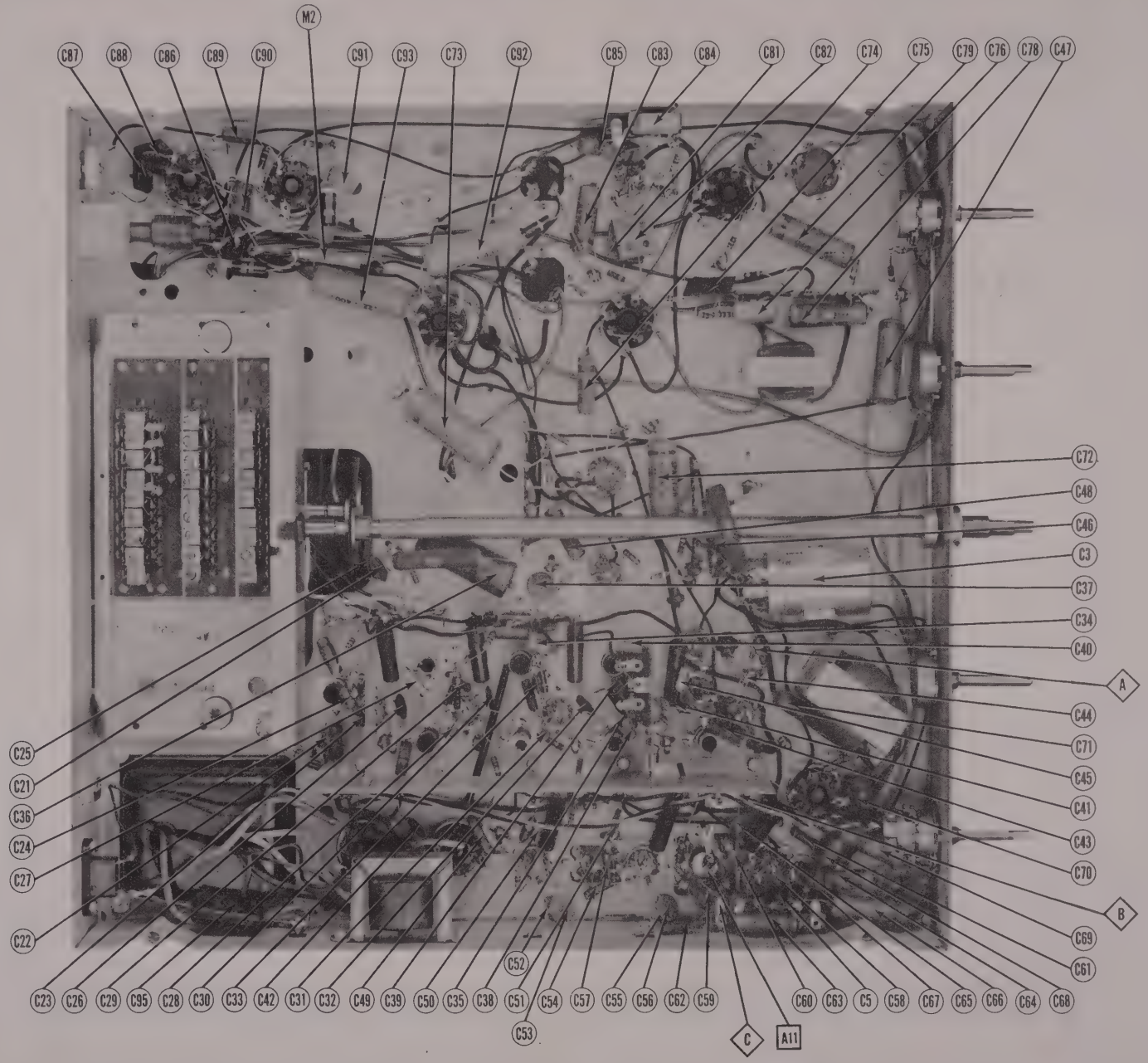
SPARTON
MODELS 5006X, 5007X

SPARTON
MODELS 5006X, 5007X

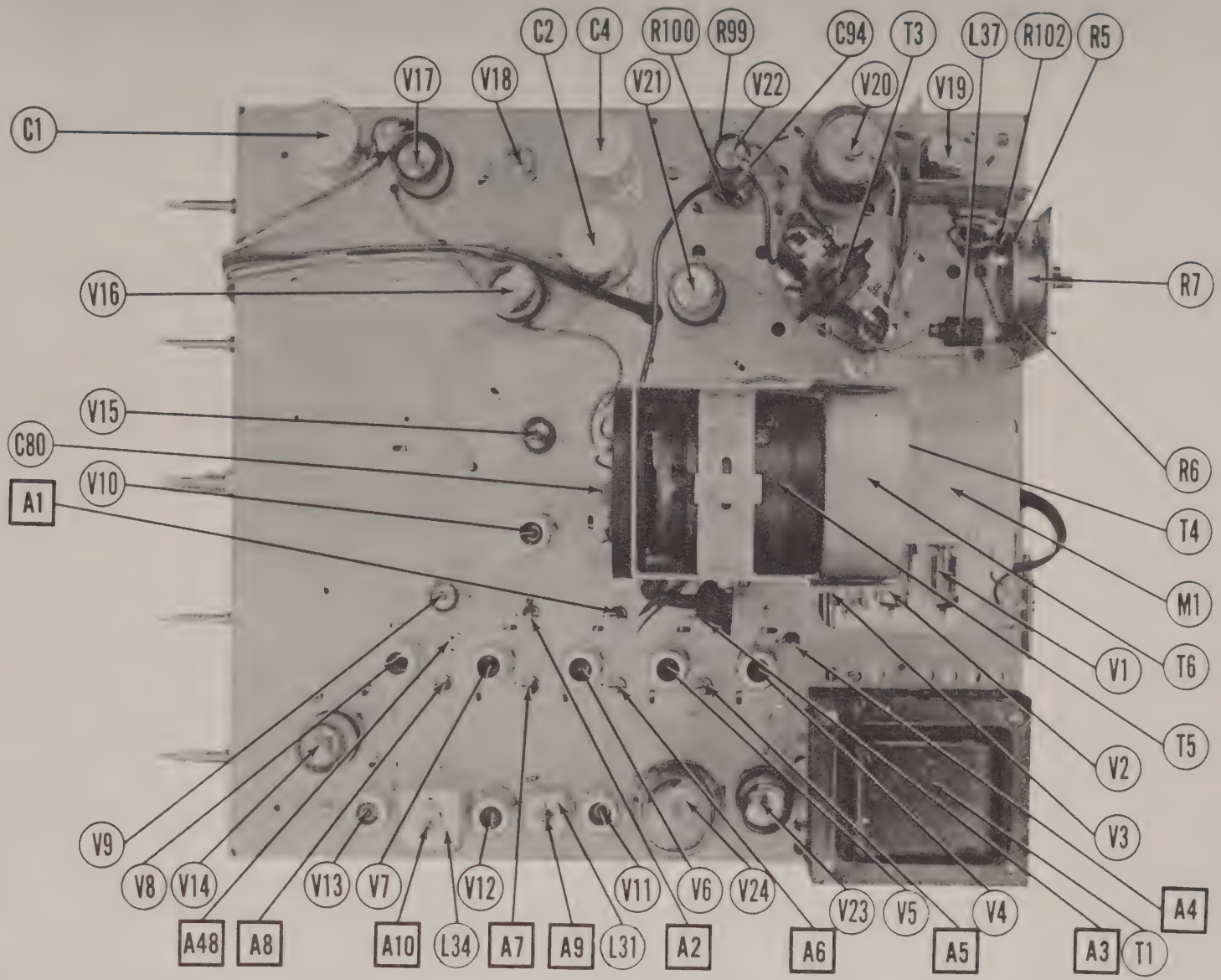




TUBE PLACEMENT CHART



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube (V19) from its socket.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volts battery to the junction of R37 and C36, connect the positive lead to chassis. Remove the local oscillator tube (V3) from its socket to prevent the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	21.75MC (Unmod.)	Any	DC probe to point (A). Common to chassis	A1, A2	Adjust for MINIMUM deflection.
2.	"	"	27.75MC	"	"	A3	"
4.	"	"	22.4MC	"	"	A4	Adjust for maximum deflection.
5.	"	"	22.5MC	"	"	A5	"
6.	"	"	25.9MC	"	"	A6	"
7.	"	"	24.1	"	"	A7	"
8.	"	"	26.0	"	"	A8	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to an ungrounded tube shield floating over mixer tube(V2). Low side to chassis.	24MC (10MC SWP)	22.7MC 25.5MC 26.25MC	Any	Vert. amp. to point (A). Low side to chassis.		Check for response curve similar to fig. 1. If necessary retouch A3 thru A8 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	Direct	High side to an ungrounded tube shield floating over mixer tube (V2) Low side to chassis.	21.75MC (Unmod.)	Any	DC probe to point (B). Common to chassis.	A9, A10	Adjust for maximum deflection.
11.	"	"	"	"	DC probe to point (C). Common to point (B).	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Direct	High side to an ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	21.75MC (10 MC SWP)	21.75MC	Any	Vert. amp. to point (B). Low side to chassis.	A9, A10	Disconnect stabilizor capacitor C5. Adjust for maximum amplitude and symmetry as per figure 2.
12.	"	"	"	"	Any	Vert. amp. to point (C). Low side to chassis.	A-11	Reconnect capacitor C5. Ajust A-11 so 21.75 MC occurs at center of crossover lines as per fig. 3. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

The sound IF section must be properly aligned before attempting oscillator alignment.

Replace the oscillator tube (V3) in its socket. Since incremental inductances are connected in series with the tuned circuits of channels 8, 10, and 12 to form tuned circuits for channels 7, 9, and 11, the order of alignment is important. It is essential that the higher of the paired channels, (7 and 8, 9 and 10, 11 and 12) be aligned first.

The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
13.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	215.75MC (Unmod.)	13	DC probe ot point (C). Common to point (B).	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
14.	"	"	209.75MC	12	"	A13	"
15.	"	"	203.75MC	11	"	A14	Expand or compress coil turns for zero reading.
16.	"	"	197.75MC	10	"	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
17.	"	"	191.75 MC	9	"	A16	Expand or compress coil turns for zero reading.
18.	"	"	185.75 MC	8	"	A17	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
19.	"	"	179.75MC	7	"	A18	Expand or compress coil turns for zero reading
20.	"	"	87.75 MC	6	"	A19	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
21.	"	"	81.75 MC	5	"	A20	"
22.	"	"	71.75 MC	4	"	A21	"
23.	"	"	65.75 MC	3	"	A22	"
24.	"	"	59.75 MC	2	"	A23	"

ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

In the event that completed alignment of the RF and mixer circuits is necessary, it is recommended that the complete tuner be returned to the factory for a replacement unit. If only one or two channels require adjustment, alignment of those channels may be performed.
Short the AGC line to chassis while adjusting the RF circuits.
Output of signal generator should be no higher than necessary to obtain an output reading.
The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
25.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	59.75MC (Unmod.)	2	DC probe to point (C). Common to point (D).		Adjust fine tuning control for zero reading.
26.	"	"	"	2	Across capacitor C5.	A24	Adjust for maximu deflection.
27.	"	"	65.75MC	3	DC probe to point (C). Common to point (D)		Adjust fine tuning control for zero reading.
28.	"	"	"	3	Across capacitor C5.	A25	Adjust for maximum deflection.
29.	"	"	7175MC	4	DC probe to point (C). Common to point (D).		Adjust fine tuning control for zero reading
30	"	"	"	4	Across capacitor C5.	A26	Adjust for maximum deflection.
31.	"	"	81.75MC	5	DC probe to point (C). Common to point (D).		Adjust fine tuning control for zero reading.
32.	"	"	81.75MC	5	Across capacitor C5.	A27	Adjust for maximum deflection.
33.	"	"	87.75MC	6	DC probe to point (C). Common to point (D)		Adjust fine tuning control for zero reading.
34.	"	"	87.75MC	6	Across capacitor C5.	A28	Adjust for maximum deflection.
35.	"	"	55.25MC	2	DC probe to point (A). Common to chassis.	A29	Adjust fine tuning control and A29 for maximum deflection.
36.	"	"	61.25MC	3	"	A30	Adjust fine tuning control and A30 for maximum deflection.
37.	"	"	67.25MC	4	"	A31	Adjust fine tuning control and A31 for max. deflection.
38.	"	"	77.25MC	5	"	A32	Adjust fine tuning control and A32 for max. deflection.
39.	"	"	83.25MC	6	"	A33	Adjust fine tuning control and A33 for max. deflection.
40.	"	"	213MC	13	"	A34, A35	Adjust fine tuning control, A34, and A35 for maximum deflection.
41.	"	"	207MC	12	"	A36, A37	Adjust fine tuning control, A36, and A37 for maximum deflection.
42.	"	"	201MC	11	"	A38, A39	Adjust fine tuning control, A38, and A39 for maximum deflection.
43.	"	"	195MC	10	"	A40, A41	Adjust fine tuning control, A40, and A41 for maximum deflection.
44.	"	"	189MC	9	"	A42, A43	Adjust fine tuning control, A42, and A43 for maximum deflection.
45.	"	"	183MC	8	"	A44, A45	Adjust fine tuning control, A44, and A45 for maximum deflection.
46.	"	"	177MC	7	"	A46, A47	Adjust fine tuning control, A46, and A47 for maximum deflection.

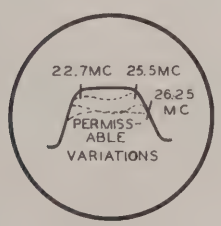


FIG. 1

FIG. 2

FIG. 3

FIG. 4

ALIGNMENT INSTRUCTIONS (CONT.)

RF RESPONSE CHECK

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE OR VTVM	ADJUST	REMARKS
47.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	Off	215.75	13	VTVM DC probe to point (C). Common to point (B).		Adjust fine tuning for zero voltage.
48.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	SCOPE Vert. amp. to point (A). Low side to chassis.	A34, A35	If necessary make slight adjustments to place markers as shown in fig. 4.
49.	"	"	Off	209.75MC	12	VTVM DC probe to point (C) Common to point (B)		Adjust fine tuning for zero voltage.
50.	"	"	207MC (10MC SWP)	205.25MC 209.75MC	12	SCOPE Vert. amp. to point (A). Low side to chassis.	A36, A37	If necessary make slight adjustments to place markers as shown in fig. 4.
51.	"	"	Off	203.75MC	11	VTVM DC probe to point (C) Common to point (B)		Adjust fine tuning for zero voltage.
52.	"	"	201MC (10MC SWP)	199.25MC 203.75MC	11	SCOPE Vert. amp to point (A) Low side to chassis	A38, A39	If necessary make slight adjustments to place markers as shown in figure 4.
53.	"	"	Off	197.75	10	VTVM DC probe to point (C) Common to point (D).		Adjust fine tuning for zero voltage.
54.	"	"	195MC (10MC SWP)	193.25MC 197.75MC	10	SCOPE Vert. amp.to point (A) Low side to chassis.	A40, A41	If necessary make slight adjustments to place markers as shown in fig. 4.
55.	"	"	Off	191.75MC	9	VTVM DC probe to point (B) Common to point (C)		Adjust fine tuning for zero voltage.
56.	"	"	189MC (10MC SWP)	187.25MC 191.75MC	9	SCOPE Vert. amp. to point (A) Low side to chassis.	A42, A43	If necessary make slight adjustments to place markers as shown in figure 4.
57.	"	"	Off	185.75	8	VTVM DC probe to point (C) Common to point (B)		Adjust fine tuning for zero voltage.
58.	"	"	183MC (10MC SWP)	181.25MC 185.75MC	8	SCOPE Vert. amp. to point (A) Low side to chassis.	A44, A45	If necessary make slight adjustments to place markers as shown in figure 4.
59.	"	"	Off	179.75MC	7	VTVM DC probe to point (C) Common to point (B).		Adjust fine tuning for zero voltage.
60.	"	"	177MC (10MC SWP)	175.25MC 179.75MC	7	SCOPE Vert. amp. to point (A) Low side to chassis.	A46, A47	If necessary make slight adjustments to place markers as shown in figure 4.
61.	"	"	Off	87.75MC	6	VTVM DC probe to point (B). Common to point (C)		Adjust fine tuning for zero voltage.
62.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	SCOPE Vert. amp. to point (A) Low side to chassis.	A28, A33	If necessary make slight adjustments to place markers as shown in figure 4.
63.	"	"	Off	81.75	5	VTVM DC probe to point (C) Common to point (D).		Adjust fine tuning for zero voltage.
64.	"	"	79MC (10MC SWP)	77.25MC 81.75MC	5	SCOPE Vert. amp. to point (A) Low side to chassis.	A27, A32	If necessary make slight adjustments to place markers as shown in figure 4.
65.	"	"	Off	71.75MC	4	VTVM DC probe to point (C) Common to point (B).		Adjust fine tuning for zero voltage.
66.	"	"	69MC	67.25MC 71.75MC	4	SCOPE Vert. amp. to point (A) Common to chassis.	A26, A31	If necessary make slight adjustments to place markers as shown in figure 4.
67.	"	"	Off	65.75MC	3	VTVM DC probe to point (C) Common to point (B).		Adjust fine tuning for zero voltage.
68.	"	"	63MC (10MC SWP)	61.25MC 65.75MC	3	SCOPE Vert. amp. to point (A) Low side to chassis.	A25, A30	If necessary make slight adjustments to place markers as shown in figure 4.
69	"	"	Off	59.75MC	2	VTVM DC probe to point (C) Common to point (B)		Adjust fine tuning for zero voltage
70.	"	"	57MC (10MC SWP)	55.25MC 59.75MC	2	SCOPE Vert. amp. to point (A) Low side to chassis.	A24, A29	If necessary make slight adjustments to place markers as shown in figure 4.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
71.	.01MFD	High side to pin 5 (cathode) of 6AL5 (V8). Low side to chassis.	Not used	4.5MC (400 ∿ Mod.)	Any channel not used locally	Vert. amp. to pin 11 of picture tube. Low to chassis.	A48	Adjust for MINIMUM 400 ∿ indication on scope.

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BH6	-.1VDC	1VDC	0V	6.3VAC	220VDC	210VDC	0V		
V 2	6AG5	-2VDC	0V	0V	6.3VAC	147VDC	110VDC	0V		
V 3	6C4	165VDC	0V	6.3VAC	0V	165VDC	§-3.7VDC	0V		
V 4	6BJ6	-.1VDC	2VDC	0V	6.3VAC	147VDC	147VDC	0V		
V 5	6BJ6	-.1VDC	2VDC	0V	6.3VAC	135VDC	135VDC	0V		
V 6	6BH6	0V	1.2VDC	0V	6.3VAC	135VDC	135VDC	0V		
V 7	6BJ6	-.1VDC	1.4VDC	0V	6.3VAC	135VDC	135VDC	0V		
V 8	6AL5	0V	-.3VDC	6.3VAC	0V	0V	0V	-1.5VDC		
V 9	6AH6	-.3VDC	0V	0V	6.3VAC	135VDC	40VDC	0V		
V 10	6AU6	135VDC	150VDC	6.3VAC	0V	-.2VDC	300VDC	150VDC		
V 11	6AU6	-.4VDC	0V	0V	6.3VAC	130VDC	130VDC	1VDC		
V 12	6AU6	-.1VDC	0V	0V	6.3VAC	130VDC	130VDC	1.1VDC		
V 13	6T8	-.4VDC	-1.1VDC	-.4VDC	0V	6.3VAC	-.3VDC	0V	-.6VDC	55VDC
V 14	6V6GT	0V	0V	235VDC	245VDC	0V	0V	6.3VAC	14VDC	
V 15	12AU7	275VDC	135VDC	140VDC	6.3VAC	6.3VAC	80VDC	-.4VDC	0V	0V
V 16	6SN7GT	-1.5VDC	320VDC	13VDC	-25VDC	410VDC 130VDC	0V	6.3VAC	0V	
V 17	6V6GT	0V	0V	320VDC	320VDC	0V	35VDC 0V	6.3VAC	45VDC 25VDC	
V 18	6AL5	1.6VDC	1.6VDC	6.3VAC	0V	5VDC	0V	-2.6VDC		
V 19	6SN7GT	.5VDC	255VDC	13VDC	-6.4VDC	115VDC	13VDC	6.3VAC	0V	
V 20	6BG6G	0V	6.3VAC	6.8VDC	-2.8VDC	-6.8VDC	-6.8VDC	0V	255VDC	TOP CAP *
V 21	6W4GT	0V	360VDC	490VDC	470VDC	360VDC	0V	6.3VAC	0V	
V 22	1X2	* DO NOT MEASURE								
V 23	6AX5	0V	0V	185VAC	0V	185VAC	0V	6.3VAC	160VDC	
V 24	5U4G	0V	400VDC	0V	370VAC	0V	370VAC	0V	400VDC	
V 25	12LP4	6.3VAC	0V	PIN 10 355VDC	PIN 11 50VDC	PIN 12 0V				

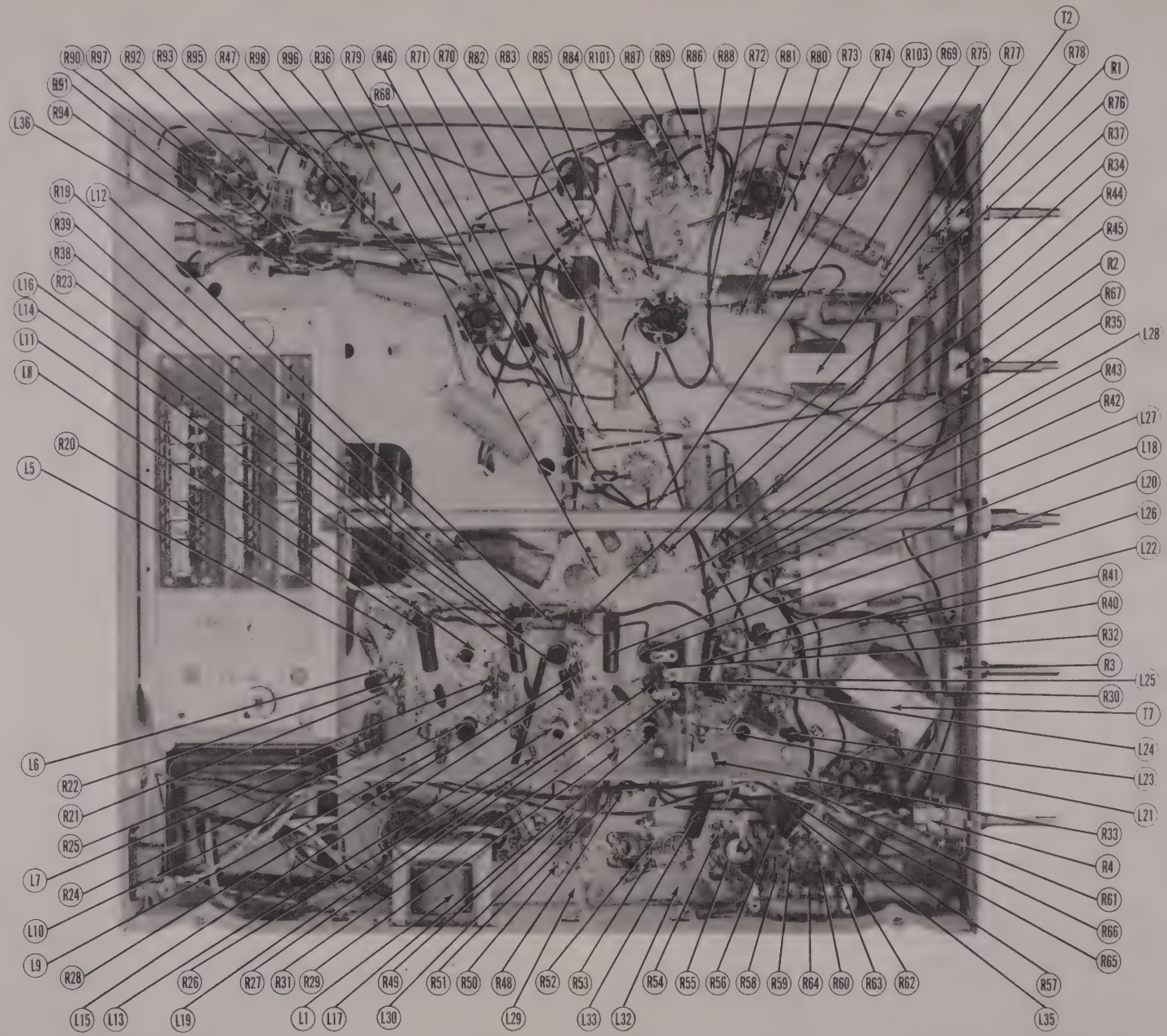
FOCUS CONTROL COUNTERCLOCKWISE
§ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT MEASURE

RESISTANCE READINGS

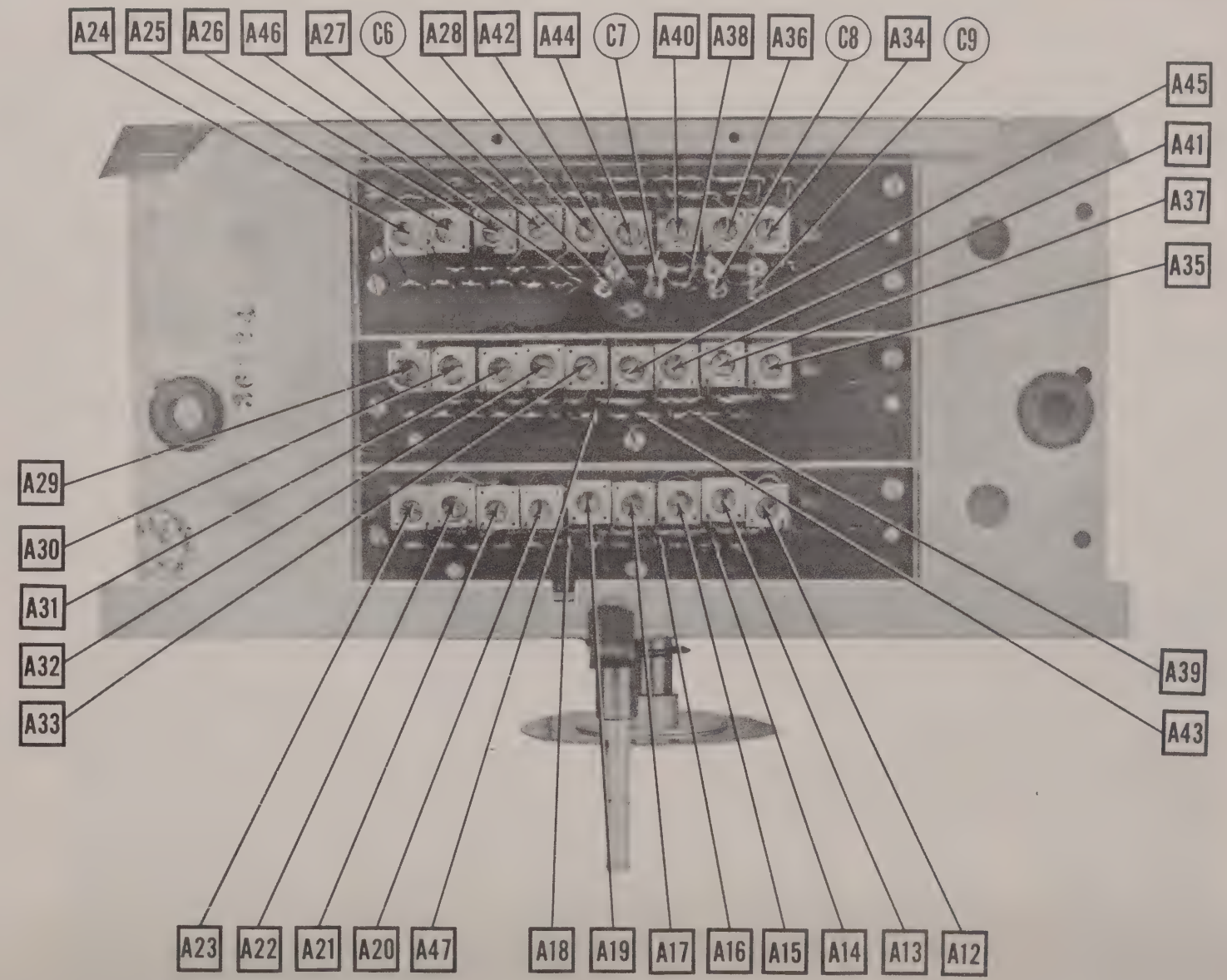
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BH6	80KΩ	100Ω	0Ω	.1Ω	#10KΩ	#23KΩ	0Ω		
V 2	6AG5	1 Meg.	0Ω	0Ω	.2Ω	†135Ω	#65KΩ	0Ω		
V 3	6C4	#8.3KΩ	Inf.	.2Ω	0Ω	#8.3KΩ	18KΩ	0Ω		
V 4	6BJ6	105K§.	100Ω	0Ω	.2Ω	†135Ω	†135Ω	0Ω		
V 5	6BJ6	95KΩ	100Ω	0Ω	.2Ω	†1.1KΩ	†1.1KΩ	0Ω		
V 6	6BH6	2.2Ω	100Ω	0Ω	.2Ω	†1.1KΩ	†1.1KΩ	0Ω		
V 7	6BJ6	95K§.	68Ω	0Ω	.2Ω	†1.1KΩ	†1.1KΩ	0Ω		
V 8	6AL5	0Ω	3.9KΩ	.1Ω	0Ω	3.3Ω	0Ω	4.7 Meg.		
V 9	6AH6	3.9KΩ	0Ω	0Ω	.2Ω	†4.4KΩ	†25KΩ	0Ω		
V 10	6AU6	†65KΩ	†130Ω	.1Ω	0Ω	130KΩ	▲22KΩ	†130Ω		
V 11	6AU6	440KΩ	0Ω	0Ω	.2Ω	†1.1KΩ	†1.1KΩ	82Ω		
V 12	6AU6	100KΩ	0Ω	0Ω	.2Ω	†1.1KΩ	†1.1KΩ	68Ω		
V 13	6T8	Inf.	20KΩ	Inf.	0Ω	.2Ω	240KΩ	0Ω	10 Meg.	†325Ω
V 14	6V6GT	0Ω	0Ω	#3.6KΩ	#3.4KΩ	470KΩ	0Ω	.1Ω	390Ω	
V 15	12AU7	▲40KΩ	†15KΩ	220KΩ	.1Ω	.1Ω	†22KΩ	2.2 Meg.	0Ω	0Ω
V 16	6SN7GT	4.7 Meg.	#6KΩ	3.3KΩ	2.2Meg.	▲150KΩ ▲1.6 Meg.	0Ω	.1Ω	0Ω	
V 17	6V6GT	Inf.	0Ω	#3.4K§.	#3.4KΩ	2.2Meg.	5KΩ 0Ω	.1Ω	6.8KΩ 1.8KΩ	
V 18	6AL5	18KΩ	18KΩ	.1Ω	0Ω	4.8Meg.	0Ω	4.8Meg.		
V 19	6SN7GT	520KΩ	▲28KΩ	1.5KΩ	150KΩ	▲220KΩ	1.5KΩ	.1Ω	0Ω	
V 20	6BG6G	Inf.	.1Ω	82Ω	50KΩ	1 Meg.	1 Meg.	0Ω	#9.5KΩ	TOP CAP ▲84Ω
V 21	6W4GT	Inf.	#280Ω	200KΩ	▲47KΩ	#275Ω	Inf.	.1Ω	0Ω	
V 22	1X2	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP ▲700Ω
V 23	6AX5	Inf.	0Ω	30Ω	Inf.	30Ω	Inf.	.1Ω	50KΩ	
V 24	5U4G	Inf.	80KΩ	Inf.	35Ω	Inf.	35Ω	Inf.	80KΩ	
V 25	12LP4	.1Ω	0Ω	PIN 10 #1.4KΩ	PIN 11 500KΩ	PIN 12 0Ω				

FOCUS CONTROL COUNTERCLOCKWISE
† MEASURED FROM PIN 8 OF V23
▲ MEASURED FROM PIN 3 OF V21
MEASURED FROM PIN 2 OF V24

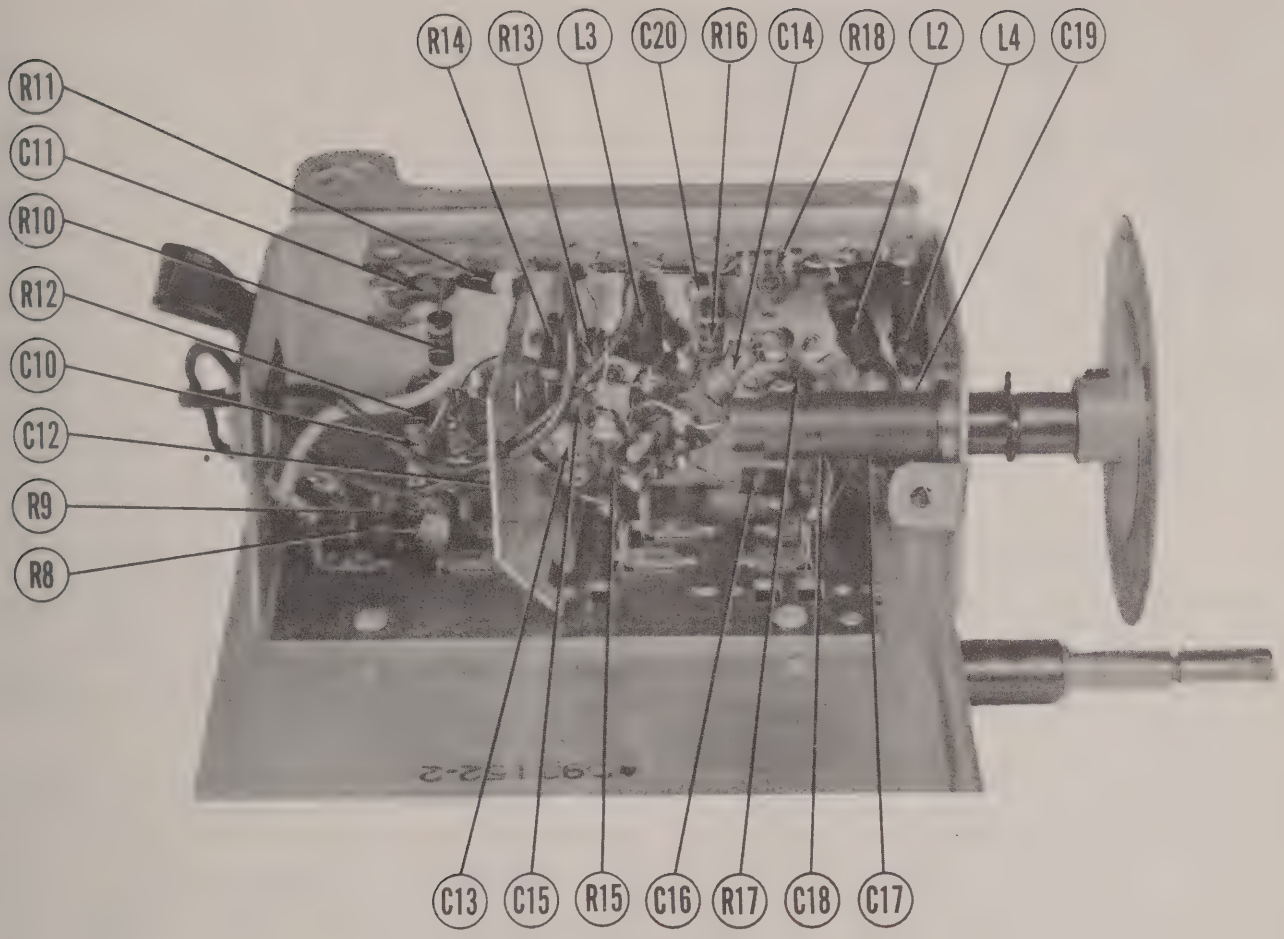
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



RF TUNER-BOTTOM VIEW



RF TUNER

DISASSEMBLY INSTRUCTIONS

1. Remove eight push-on type control knobs.
2. Remove ten wood screws holding rear cover in place. Remove rear cover.
3. Disconnect built-in antenna.
4. Disconnect speaker leads.
5. Remove two 11/32" hex nuts holding speaker in place. Remove speaker.
6. Remove four 3/8" hex head bolts holding chassis in cabinet. Remove chassis.

NOTE: FOR PICTURE TUBE REMOVAL, IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6BH6	6BH6	7CM	
V2	Mixer	6AG5	6AG5	7BD	
V3	RF Oscillator	6C4	6C4	6BG	
V4	1st Video IF Amp.	6BJ6	6BJ6	7CM	
V5	2nd Video IF Amp.	6BJ6	6BJ6	7CM	
V6	3rd Video IF Amp.	6BH6	6BH6	7CM	
V7	4th Video IF Amp.	6BJ6	6BJ6	7CM	
V8	Video Det.	6AL5	6AL5	5BT	
V9	Video Amp.	6AR6	6AR6	7BK	
V10	AGC Keying	6AU6	6AU6	7BK	
V11	1st Sound IF Amp.	6AU6	6AU6	7BK	
V12	2nd Sound IF Amp.	6AU6	6AU6	7BK	
V13	Ratio Det.-AVC-AF Amp.	6T8	6T8	9E	
V14	Audio Output	6V6GT	6V6GT	7AC	
V15	Sync. Sep.-Sync. Amp.	12AU7	12AU7	9A	
V16	Vert. Oscillator	6SN7GT	6SN7GT	8BD	
V17	Vert. Output	6V6GT	6V6GT	7AC	
V18	Hor. Phase Det.	6AL5	6AL5	5BT	
V19	Hor. Mult.	6SN7GT	6SN7GT	8BD	
V20	Hor. Output	6BG6G	6BG6G	5BT	
V21	Damper	6W4GT	6W4GT	4CG	
V22	HV Rectifier	1X2	1X2	7CB	
V23	LV Rectifier	6AX5	6AX5	8S	
V24	LV Rectifier	5U4G	5U4G	5T	
V25	Picture Tube	12LP4	12LP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SPARTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	475	PA4307-19	AF8X81		UPT450-4		TVL-2830	▲ Filter
B	40	250				40C3			▲ Filter —
C2A	40	475	PA4307-13	AF88K		UP4450		TVL-2830	▲ Filter
B	40	475							▲ Filter
C3A	20	450	PA4307-16	AF832J5A		UPT42145C		TVL-4734	▲ Output Decoupling
B	40	250							■ Filter
C	10	200							▲ V. Amp. Screen
D	20	25							Output Cathode
C4A	20	450	PA4307-18	AF842J20B		UPT22345		TVL-3780	▲ Decoupling
B	20	450				V10		TVA-1207	■ Decoupling
C	10	450							▲ Vert. Osc. Dec.
D	100	25							Vert. Output Cathode
C5	5	50	PA4306-2	PRS150/4		BR550		TVA-1303	Stabilizing Cap.
C6	15				TCZ-15		NPOK-15	19C5	Fixed Padder
C7	15				TCZ-15		NPOK-15	19C5	Fixed Padder
C8	15				TCZ-15		NPOK-15	19C5	Fixed Padder
C9	15				TCZ-15		NPOK-15	19C5	Fixed Padder
C10	47			SI47N750	TCN-47		N750L-47	19C9	RF Coupling
C11	470			SI470	D6-471		GP2K-470	19C15	AGC Filter
C12	470			SI470	D6-471		GP2K-470	19C15	RF Amp. Screen
C13	47			SI47	D6-470		GP1K-47	19C25	RF Coupling
C14	470			SI470	D6-471		GP2K-470	19C15	Mixer Screen
C15	470			SI470	D6-471		GP2K-470	19C15	Mixer Filament
C16	1.5			SIL5NPO	TCZ-1.5		NPOK-1.5		Osc. Coupling
C17	10			SI10N750	TCN-10		N750K-10	19C4	Osc. Feedback
C18	10			SI10	D6-100		GP1K-10	19C19	Osc. Grid Cap.
C19	470			SI470	D6-471		GP2K-470	19C15	Osc. Fil. Bypass
C20	470			SI470	D6-471		GP2K-470	19C15	RF Bypass
C21	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C22	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	29C1	Mixer Plate Dec.
C23	270		HK36M-271	SI270	D6-271	5W5T25	GP2K-270	19C31	IF Coupling
C24	1000		HK36H-102	SI1000	D6-102	1W5D1	GP2L-001	19C1	AGC Filter
C25	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	29C1	AGC Filter
C26A	1000		PA4345-1	BPD-2X001	DD-2-102	1W5D1	812-2X001	29C7	1st V. IF Dec.
B	1000					1W5D1			1st V. IF Dec.
C27	100		CC30A-101F	SI100NPO	TCZ-100		NPOM-100	36C10	Fixed Trimmer
C28	270		HK36M-271	SI270	D6-271	5W5T25	GP2K-270	19C31	IF Coupling
C29	1000		HK36H-102	SI1000	D6-102	1W5D1	GP2L-001	19C1	AGC Filter
C30A	1000		PA4345-1	BPD-2X001	DD-2-102	1W5D1	812-2X001	29C7	2nd V. IF Dec.
B	1000					1W5D1			2nd V. IF Fil.
C31	270		HK36M-271	SI270	D6-271	5W5T25	GP2K-270	19C31	IF Coupling
C32A	1000		PA4345-1	BPD-2X001	DD-2-102	1W5D1	812-2X001	29C7	3rd V. IF Dec.
B	1000					1W5D1			3rd V. IF Fil.
C33	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	29C1	3rd V. IF Cath.
C34	470	500	MC60E-471						Fixed Trimmer
C35	270		HK36M-271	SI270	D6-271	5W5T25	GP2K-270	19C31	IF Coupling
C36	.5	200	PC40GK-504	P288-5		GT2P5		2TM-P5	AGC Filter
C37	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	29C1	AGC Filter
C38	1000		HK36H-102	SI1000	D6-102	1W5D1	GP2L-001	19C1	AGC Filter
C39	1000		HK36H-102	SI1000	D6-102	1W5D1	GP2L-001	19C1	RF Bypass
C40	470	500	MC60E-471						Fixed Trimmer
C41A	1000		PA4345-1	BPD-2X001	DD-2-102	1W5D1	812-2X001	29C7	4th V. IF Dec.
B	1000					1W5D1			4th V. IF Fil.
C42	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C43	51	500		1468-00005	D6-500	5W5Q5	GP1K-51	1FM-45	IF Coupling
C44	10		CC30A-100F	SI10NPO	TCZ-10	5W5Q1	NPOK-10	19C3	V. Diode Filter
C45	47			SI47NPO	TCZ-47	5R5Q5	NPOM-47	29C14	Fixed Trimmer
C46	.05	400	PC40GL-503	P488-05	DF-503	PTE4S5		4TM-S5	Video Coupling
C47	.1	200	PC40GK-104	P288-1	DF-104	PTE4P1		2TM-P1	Pic. Tube Grid
C48	.001	600	PC40GM-102	P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	Hor. Sweep Coupling
C49	100		CC32A-101A	SI100	D6-101	5W5T1	GP1K-100	19C11	S. IF Coupling
C50	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	29C1	AVC Filter
C51	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	29C1	AVC Filter
C52	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	29C1	1st S. IF Dec.
C53	5000		PA4334-1	BPD-006	DD-502	1D5D5	811-005	29C1	1st S. IF Fil.
C54	100		CC32A-101A	SI100	D6-101	5W5T1	GP1K-100	19C11	S. IF Coupling
C55	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	29C1	2nd S. IF Dec.

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SPARTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C56	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	29C1	2nd S. IF Fil.
C57	1000		HK36H-102	SI1000	D6-102		GP2L-001	19C1	2nd S. IF Cath.
C58	3.3		PA4326-4	SI3.3NPO	TCZ-3.3		NPOK-3.3		Balancing
C59	270	500	HK36M-271	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	Diode Load Cap
C60	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C61	1000		HK36H-102	SI1000	D6-102	1W5D1	GP2L-001	19C1	DAVC Dec.
C62	2000		HK36G-202	SI2000	D6-202	1W5D2	GP2M-002	29C2	De-emphasis
C63	.02	200	PC40GK-203	P488-02	DF-203	PTE4S2		2TM-S2	Audio Coupling
C64	.02	200	PC40GK-203	P488-02	DF-203	PTE4S2		2TM-S2	Audio Coupling
C65	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	29C1	Ratio Det.-AF Fil.
C66	.05	400	PC40GL-503	P488-05	DF-503	PTE4S5		4TM-S5	Decoupling
C67	100	500	MC60E-101	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	AF Amp. Plate
C68	.02	600	PC40GM-203	P688-02	DF-203	PTE6S2		6TM-S2	Audio Coupling
C69	.005	600	PC40GM-502	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Tone Comp.
C70	.03	200	PC40GK-303	P488-03		PTE8S3		6TM-S3	Tone Comp.
C71	.005	600	PC40GM-502	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Output Plate Bypass
C72	.05	600	PC40GL-503	P688-05	DF-503	PTE6S5		6TM-S5	Sync. Coupling
C73	.5	200	PC40GK-504	P288-5		GT2P5		2TM-P5	Sync. Amp. Cath.
C74	.001	600	PC40GM-102	P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	Sync. Coupling
C75A	2000		PA4339-4	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	Integrator Net
B	5000			P688-005	D6-502	PTE6D5	811-005	6TM-D5	Integrator Net
C	5000			P688-005	D6-502	PTE6D5	811-005	6TM-D5	Integrator Net
C76	4700	500		1467-005	D6-472	1D5D5	GP2M-0047	1FM-25	Vert. Osc. Grid
C77	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	29C1	Vert. Osc. Dec. *
C78	.05	400	PC40GL-503	P488-05		PTE4S5		4TM-S5	Vert. Discharge
C79	.1	400	PC40GL-104	P488-1	DF-104	PTE4P1		4TM-P1	Vert. Sweep Coupling
C80	.1	200	PC40GK-104	P288-1	DF-104	PTE4P1		2TM-P1	Fixed Trimmer
C81	1000	500	MC81E-102	1467-001	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Sync. Coupling
C82	1000	500	MC81E-102	1467-001	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Sync. Coupling
C83	.01	600		P688-01	D6-103	PTE6S1	821-01	6TM-S1	Voltage Divider
C84	5000	500	MC81E-512	1467-005	D6-502	1D5D5	811-005	1FM-25	AFC Filter
C85	.05	200		P288-05	DF-503	PTE4S5		2TM-S5	AFC Filter
C86	3900	500	MC83F-392	1464-004		1DR5D4		MS-24	Fixed Trimmer
C87	330	500	MC60E-331	1469-00035	D6-331	5R5T3	GP2K-330	MS-33	Hor. MV Feedback
C88	330	500	MC60E-331	1469-00035	D6-331	5R5T3	GP2K-330	MS-33	Hor. Discharge
C89	270	500	HK36M-271	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	Hor. Sweep Coupling
C90	10	1500	PA4327-2	1469-HV-00001					Horiz. Feedback
C91	.047	400	PC42GL-473	P488-047	DF-503	PTE4S5		4TM-S47	Hor. Output Screen
C92	.22	400	PC42GL-224	P488-22		GT4P25		4TM-P22	Damper Filter
C93	.22	400	PC42GK-224	P488-22		GT4P25		4TM-P22	Hor. Sweep Coupling
C94	500	20000	PA4346	HV20C	TV2-502				H.V. Filter
C95	.05	600	PC42GM-473	P688-05	DF-503	PTE6S5		6TM-S5	Line Filter

* Not Used In All Models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SPARTON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	50KΩ	½	PA4430-1	Concentrikit B11-123 *	RTV-84	SBB-630	Horiz. hold control - panel
B	1Meg	½		B11-137 *			Vert. hold control - rear
C	Shaft End			E-187 *			Attach per instructions in concentrikit
R2A	100KΩ	½	PA4432	Q11-128	AM-49-8	B-40	Brightness control
B	Shaft		Not req.	Not req.	FS-3		Attach to R2A per instructions
R3A	25KΩ	½	PA4442	Q11-120	AM-40-8	B-26	Contrast control
B	Shaft		Not req.	Not req.	FS-3		Attach to R3A per instructions
R4A	1Meg	½	PA4428-1	Concentrikit B11-137 *	RTV-200	SBBT-629-S	Tone control - panel
B	330KΩ	½		B18-132 *			Volume control - tapped ② 50KΩ - rear
C	Shaft End			E-187 *			Attach per instructions in concentrikit
D	Switch			T6-1 *			Attach per instructions in concentrikit
R5A	2.5Meg	½	PA4431	Q11-239	AG-84-8	AN-83	Vert. size control
B	Shaft		Not req.	Not req.	FKS-1/4	AK-1	Attach to R5A per instructions
R6	5000Ω	2	PA4411	W-5000	43-5000	VK-135	Vert. linearity control
R7	1500Ω	4	PA4426-1		RTV-6		Focus control - wire wound

* Additional Parts To Be Used With Concentrikit.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SPARTON PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE STATED
R8	100KΩ 20%	½			Antenna Coil Shunt
R9	100KΩ 20%	½			Antenna Coil Shunt
R10	47KΩ	½			RF Amp. Grid - See Note
R11	1000Ω	½		BTS-1000	AGC Network
R12	100Ω	½		BTS-100	RF Amp. Cathode
R13	15KΩ	½			RF Amp. Screen
R14	2200Ω 5%	1		BTS-2200-5%	RF Amp. Plate
R15	1Meg	½			Converter Grid
R16	56KΩ	½			Converter Screen
R17	18KΩ	½			Osc. Grid
R18	470Ω	½		BTS-470	Osc. Plate
R19	7500Ω	10		1 3/4A-7500	Decoup.- Wire Wound
R20	1000Ω	½		BTS-1000	AGC Network
R21	15KΩ 5%	½			1st Video IF Amp. Grid
R22	100Ω	½		BTS-100	1st Video IF Amp. Cathode
R23	1000Ω	½		BTS-1000	AGC Network
R24	3300Ω	½		BTS-3300	2nd Video IF Amp. Grid
R25	100Ω	½		BTS-100	2nd Video IF Amp. Cathode
R26	1000Ω	½		BTS-1000	2nd Video IF Amp. Decoup.
R27	15KΩ	½			3rd Video IF Amp. Grid
R28	100Ω	½		BTS-100	3rd Video IF Amp. Cathode
R29	1000Ω	½		BTS-1000	3rd Video IF Amp. Decoup.
R30	1000Ω	½		BTS-1000	AGC Network
R31	3300Ω 5%	½		BTS-3300-5%	4th Video IF Amp. Grid
R32	68Ω 5%	½			4th Video IF Amp. Cathode
R33	1000Ω	½		BTS-1000	4th Video IF Amp. Decoup.
R34	2.2Meg	½		BTS-2.2Meg	AGC Keying Grid
R35	47KΩ	½		BTS-47K	Voltage Divider
R36	27KΩ	½		BTS-27K	AGC Network
R37	15KΩ 5%	½		BTS-15K-5%	AGC Network

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SPARTON PART No.	IRC PART No.	IDENTIFICATION CODES
R38	56KΩ 5%	½		BTS-56K-5%	AGC Network
R39	33KΩ 5%	½		BTS-33K-5%	AGC Network
R40	3900Ω 5%	½		BTS-3900-5%	Video Amp. Grid
R41	15KΩ	1		BTS-15K	Voltage Divider
R42	4300Ω 5%	1			Video Amp. Plate
R43	10KΩ	½		BTS-10K	Voltage Divider
R44	1Meg	½		BTS-1Meg	Video Peaking
R45	1Meg	½		BTS-1Meg	Picture Tube Cathode
R46	5100Ω 5%	½			Voltage Divider
R47	1000Ω	½		BTS-1000	ACC Anode Load
R48	100KΩ	½		BTS-100K	AVC Network
R49	100KΩ	½			1st Sound IF Amp. Grid
R50	82Ω 5%	½		BTS-82-5%	1st Sound IF Amp. Cathode
R51	1000Ω	½		BTS-1000	1st Sound IF Amp. Decoup.
R52	100KΩ	½			2nd Sound IF Amp. Grid
R53	68Ω	½			2nd Sound IF Amp. Cathode
R54	1000Ω	½		BTS-1000	2nd Sound IF Amp. Decoup.
R55	27KΩ	½		BTS-27K	De-emphasis
R56	10KΩ	½		BTS-10K	Ratio Det. Diode Load
R57	10KΩ	½		BTS-10K	Ratio Det. Diode Load
R58	470Ω	½		BTS-470	Balancing
R59	220KΩ	½		BTS-220K	AVC Network
R60	1Meg 30%	½		BTS-1Meg	Voltage Divider
R61	10KΩ	½		BTS-10K	Tone Compensation
R62	10Meg	½		BTS-10Meg	AF Amp. Grid
R63	270KΩ	½		BTS-270K	AF Amp. Plate
R64	56KΩ	½		BTS-36K	AF Amp. Plate Decoup.
R65	470KΩ 20%	½		BTS-470K	Output Grid
R66	390Ω	1		BTA-390	Output Cathode
R67	3000Ω	10		1 3/4A-3000	Output Decoup.- Wire Wound
R68	180KΩ 5%	½		BTS-180K-5%	Voltage Divider
R69	18KΩ	½		BTS-18K	Sync. Sep. Plate
R70	2.2Meg 20%	½		BTS-2.2Meg	Sync. Clipper
R71	22KΩ 5%	½		BTS-22K-5%	Sync. Clipper Plate
R72	22KΩ	½		BTS-22K	Integrator
R73	8200	½		BTS-8200	Integrator
R74	8200	½		BTS-8200	Integrator
R75	1.1Meg 5%	½			Voltage Divider
R76	100KΩ	½		BTS-100K	Voltage Divider
R77	6.8Meg	½		BTS-6.8Meg	Voltage Divider
R78	100KΩ	½		BTS-100K	Vert. Osc. Plate
R79	47KΩ	½		BTS-47K	Vert. Osc. Plate Decoup.
R80	2.2Meg	½		BTS-2.2Meg	Vert. Output
R81	1800Ω	1		BTS-1800	Vert. Output Cathode
R82	2200Ω	1		BTA-2200	Decoup.
R83	4.7Meg 20%	½		BTS-4.7Meg	Phase Inv. Grid
R84	3300Ω	½		BTS-3300	Phase Inv. Cathode
R85	3300Ω 5%	½		BTS-3300-5%	Phase Inv. Plate
R86	100KΩ	½		BTS-100K	Horiz. Phase Det. Diode Load
R87	100KΩ	½		BTS-100K	Horiz. Phase Det. Diode Load
R88	4.7Meg	½		BTS-4.7Meg	Horiz. Phase Det. Diode Load
R89	470KΩ 20%	½		BTS-470K	Horiz. AFC Filter
R90	1500Ω 5%	½		BTS-1500-5%	Horiz. MV Cathode
R91	5600Ω 5%	½		BTS-5600-5%	Horiz. MV Plate
R92	100KΩ 5%	½		BTS-100K-5%	Horiz. MV Grid
R93	200KΩ 5%	½			Horiz. MV Plate
R94	22KΩ 5%	2		BTS-22K-5%	Decoup.
R95	68Ω 5%	½			Parasitic Supp.
R96	1Meg	½		BTS-1Meg	Horiz. Output Grid
R97	82Ω	1		BW-1-82	Horiz. Output Cathode
R98	9100Ω	2			Horiz. Output Screen
R99	3.3Ω	½			HV Rectifier Filament
R100	1Meg 20%	1			HV Filter
R101	18KΩ	½		BTS-18K	Horiz. Feedback
R102	270Ω	2		BW-2-270	Focus Coil Shunt
R103	8200 5%	½		BTS-8200-5%	Vert. Peaking

Note: Some Models Use 1Meg Resistor In This Application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ⑥1.8A	760VCT ⑦.170 ADC	400VCT ⑦.112 ADC	5VAC ③ 3A SEC. 4 6.3VAC ④9.6A	AB44018-1	P-8157	P3067	

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	150Ω	780Ω	AB47006-4	A-8111	A-3000	TBO-1	Vert. Osc. Block Trans.
T3	700Ω Tapped ③84Ω	5.1Ω Tapped ⑤ 4.1Ω And .2Ω SEC.2 0Ω	PC7007		HVO-6		Horiz. Output Trans.
T4	680Ω	6.5Ω	AB44062-4	A-8115	A-3035	TSO-1	Vert. Output Trans.
T5A	14Ω		PC7004	DY-7	MD-3		Horiz. Deflection Coil
B	62Ω						Vert. Deflection Coil
T6	300Ω		PC70005-1	FC-10	MF-1		Focus Coil

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO* PART No.	
	PRI.	SEC.	PRI.	SEC.					
T7	6.3KΩ	3.8Ω	250Ω	.8Ω	AB44066-2	A-3823	A-3019	RO-9 ①	① Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	SPARTON PART No.	JENSEN PART No.	QUAM PART No.	
SP1	160Ω	3.8Ω	PC63000-29		57E160S	
	CONE DIA.	V. C. DIA.				
SP2	4 3/4"X 7"	3/4"				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∽)	SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.112A	130Ω	5 Henries	AB47000-1	C-2303 ①	C2994		① Drill one new mtg. hole

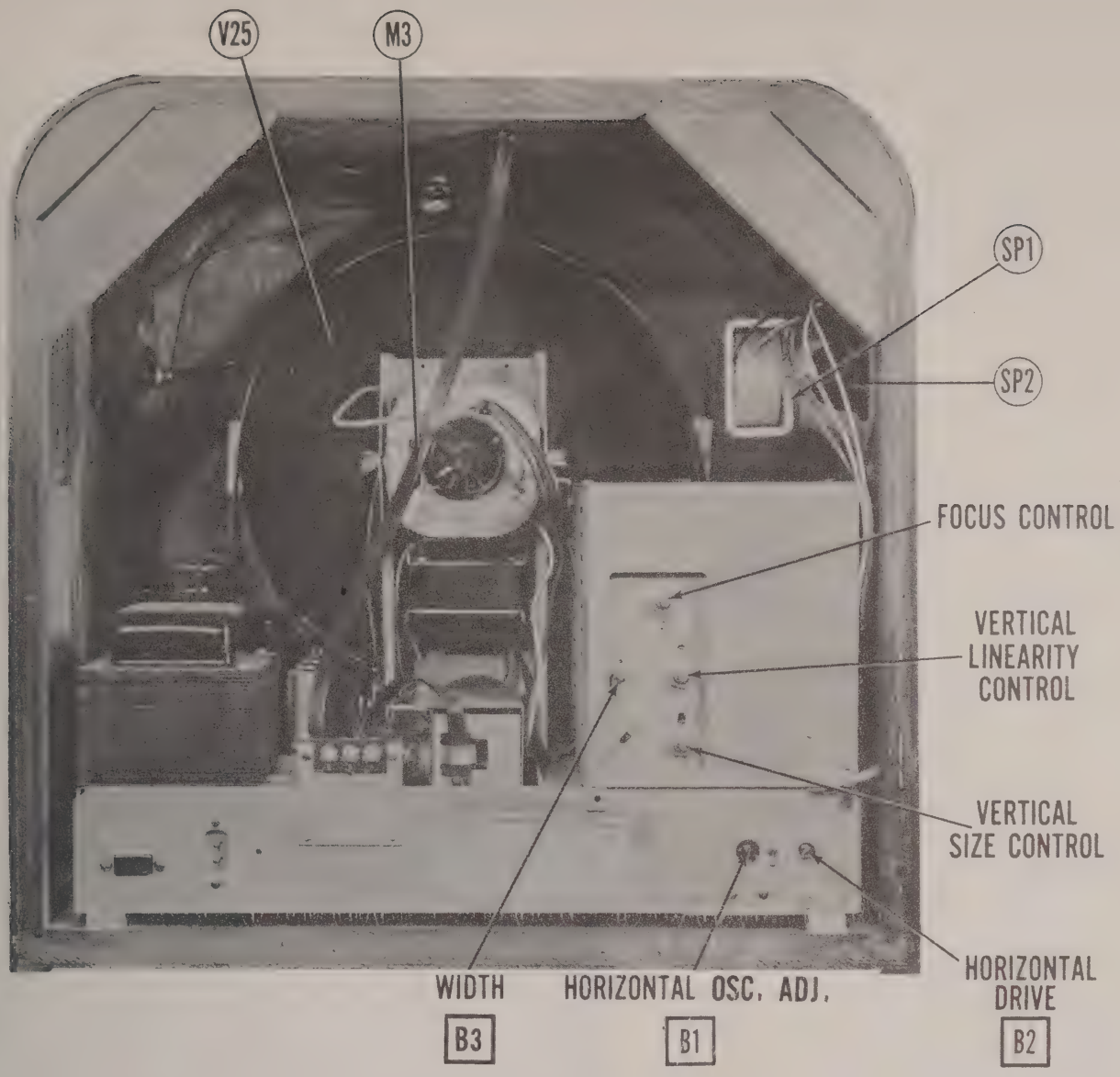
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	SPARTON PART No.	MEISSNER PART No.	IRC PART No.	
L2	RF Choke	.1Ω		*			1.4 Microhenries
L3	Fil. Choke	.1Ω		*			1.6 Microhenries
L4	Fil. Choke	.1Ω		*			1.6 Microhenries
L5	IF Trap	.1Ω		AA6654-1			
L6	1st Video IF	.1Ω		AB43523-8			
L7	RF Choke	3Ω		PA4225-3		CLA	3.3 Microhenries
L8	Fil. Choke	.1Ω		AA6651-1			3 Microhenries
L9	RF Choke	3Ω		PA4225-3		CLA	3.3 Microhenries
L10	2nd Video IF	.1Ω		AB43523-6			
L11	Adj. Channel Sound Trap	.1Ω		AB43524-10			
L12	RF Choke	3Ω		PA4225-3		CLA	3.3 Microhenries
L13	3rd Video IF	.2Ω		AB43523-10			
L14	Fil. Choke	.1Ω		AA6651-1			3 Microhenries
L15	Grid Choke	2Ω		AA6644-1			11 Microhenries
L16	Sound Take Off Coil	.1Ω	.2Ω	AB43524-8			
L17	4th Video IF	.2Ω		AB43523-10			
L18	Fil. Choke	.1Ω		AA6651-1			3 Microhenries
L19	Grid Choke	2Ω		AA6644-1			11 Microhenries
L20	Sound Trap	.1Ω		AB43524-9			
L21	5th Video IF	.2Ω		AB43523-11			
L22	Fil. Choke	.1Ω		AA6651-1			3 Microhenries
L23	Peaking	3.3Ω		AA6650-1			25 Microhenries
L24	Peaking	7.7Ω		AA6402-2	19-1921 ①		120 Microhenries Wound On 22KΩ Resistor
L25	4.5 MC Trap	2.6Ω		AA6404-1			
L26	Peaking	11Ω		AA6613-7	19-1922		243 Microhenries
L27	Peaking	10Ω		AA6402-5	19-1921 ②		180 Microhenries Wound On 12KΩ Resistor
L28	Peaking	10Ω		AA6402-4	19-1922 ③		200 Microhenries Wound On 33KΩ Resistor
L29	RF Choke	0Ω					Length of #22 Wire
L30	Fil. Choke	.1Ω		AA6651-1			3 Microhenries
L31	Sound IF	.4Ω		AA6663-2			
L32	RF Choke	0Ω					Length of #22 Wire
L33	Fil. Choke	.1Ω		AA6651-1			3 Microhenries
L34	Ratio Det. Trans.	.6Ω	.1Ω	AA6684-3			
L35	Fil. Choke	.1Ω		AA6651-1			3 Microhenries
L36	Horiz. Osc. Coil	50Ω		AA6403-2			
L37	Width Coil	.7Ω		AA6405-3			

* Part Of Tuner Part No. AD93152-2
① Parallel With 22KΩ Resistor
② Parallel With 12KΩ Resistor
③ Parallel With 33KΩ Resistor

MISCELLANEOUS

ITEM No.	PART NAME	SPARTON PART No.	NOTES
M1	RF Tuner	AD93152-2	Complete With Tubes
M2	Fuse		.25A 250V Type GJV
M3	Ion Trap	PA1175	
B2	Trimmer	PA4368	Horiz. Drive 20-270MMF
	Safety Glass	PC63078-1	
	Knob	PA5631-1	Channel Selector
	Knob	PA5630-1	Fine Tuning
	Knob	PA5632-1	Volume-Vert.Hold
	Knob	PA5633-1	Tone - Horizontal Hold
	Knob	PA5634-1	Contrast - Brightness
	Knob	PA5650	Antenna
	Band	PA6572-2	Indicator Dial



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal oscillator coil (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) counter-clockwise until one or more vertical white lines appear in the picture and then clockwise just far enough to remove the lines.

Turn the channel switch to channel 13 and check for Barkhausen oscillations as indicated by black lines or smudges in the raster.

If indications of oscillations are present adjust B2 for best compromise between the vertical white lines and Barkhausen oscillations.

Adjust the width slug B3 until the picture fills the mask horizontally.

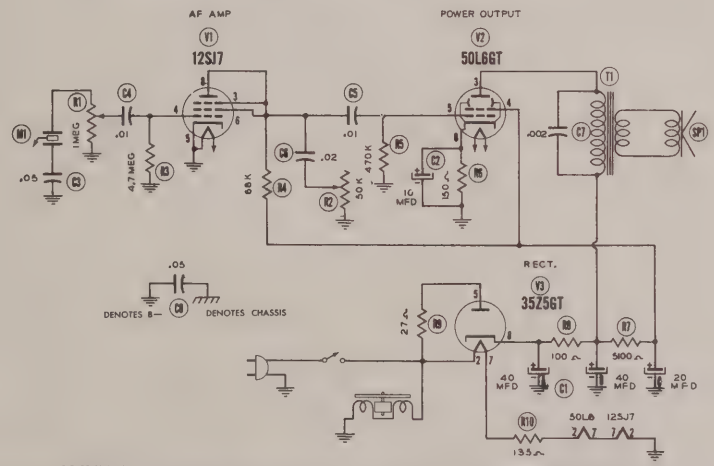
WEBSTER-CHICAGO
MODEL 100-608

WEBSTER-CHICAGO
MODEL 100-608

WEBSTER-CHICAGO MODEL 100-608

TRADE NAME	Webster-Chicago, Model 100-608
MANUFACTURER	Webster-Chicago, 5610 Bloomingdale Ave., Chicago 19, Illinois
TYPE SET	AC Operated Automatic Phono Player with 3 Tube Amplifier
TUBES (THREE)	Types 12SJ7 AF Amp., 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC RATING .24 Amp. at 117 Volts AC

RECORD CHANGER-- WEBSTER-CHICAGO MODEL 100



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SJ7	0V	0V	25VDC	-1.2VDC	0V	25VDC	13VAC	25VDC
V 2	50L6GT	0V	85VAC	105VDC	95VDC	0V	0V	13VAC	6.6VDC
V 3	35Z5GT	0V	117VAC	0V	115VDC	110VAC	0V	80VAC	117VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SQ7	Inf.	0Ω	†75KΩ	4.7Meg	0Ω	†75KΩ	12Ω	†75KΩ
V 2	50L6GT	Inf.	60Ω	†280Ω	†5.2KΩ	470KΩ	0Ω	12Ω	150Ω
V 3	35Z5GT	Inf.	225Ω	Inf.	†300Ω	250Ω	0Ω	195Ω	40KΩ

† MEASURED FROM PIN 8 OF V3

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A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: WEB.-CHIC. PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	AF Amp.	12SJ7	12SJ7	8N	
V2	Power Output	50L6	50L6	7AC	
V3	Rectifier	35Z5	35Z5	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: WEB.-CHIC. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	150		PRS150/40-		EDL44215		TVL-3451	Filter-Red
B	40	150		40-40					Filter-Red
C	20	150							Filter-Blue
C2	10	25		PRS25/10		BR102A		TVA-1204	Output Cath. Byp. *
C3	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Phono Isolation
C4	.01	400		P488-01	D6-103	PTE4S1	821-01	4TM-S1	Audio Coupling
C5	.01	400		P488-01	D6-103	PTE4S1	821-01	4TM-S1	Audio Coupling
C6	.02	400		P488-02	DF-203	PTE4S2		4TM-S2	Tone Comp.
C7	.002	600		P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	Output Plate Byp.
C8	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Line Isolation

* Not used in all models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: WEB.-CHIC. PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	31P052	Q13-136	AG-63-Z	AN-70	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R1A per instructions
R2A	50KΩ	½	31P058	Q11-123	AG-44-S	AN-31	Tone control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R2A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: WEB.-CHIC. PART No.	IRC PART No.	IDENTIFICATION CODES
R3	4.7 Meg.	½		BTS-4.7 Meg.	AF Amp. Grid
R4	68KΩ	½		BTS-68K	AF Amp. Load
R5	470KΩ	½		BTS-470K	Output Grid
R6	150Ω	½		BTS-150	Output Cathode
R7	5100Ω	½			Filter
R8	100Ω	½		BTS-100	Surge Limiter
R9	27Ω	½			Rectifier Ballast
R10	135Ω	5			Filament Dropping-Wire Wound

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: WEB.-CHIC. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	2.6KΩ	4Ω	180Ω	.7Ω	67P006	A-3876	A-2928	RO-2	

SPEAKER

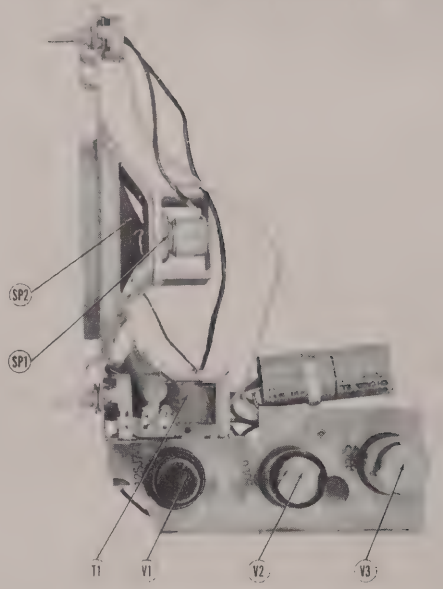
ITEM No.	RATINGS		REPLACEMENT DATA: WEB.-CHIC. PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.				
SP1	PM	4Ω		ST-105 MOD. P5-X	5A07	
	CONE DIA.	V. C. DIA.				
SP2	4 3/4"	9/16"				

PHONO CARTRIDGE and NEEDLE

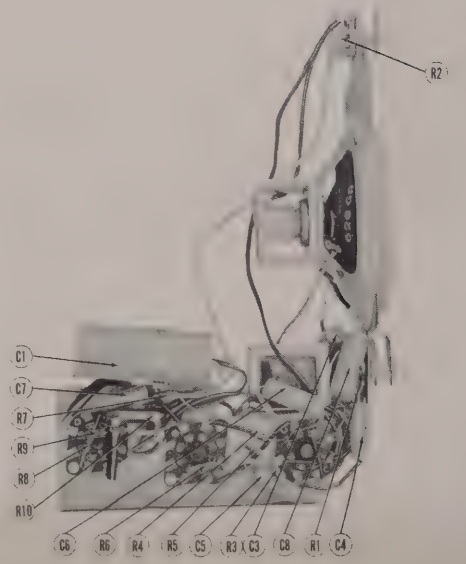
ITEM No.	REPLACEMENT DATA: WEB.-CHIC. PART No.	ASTATIC PART No.: CARTRIDGE	ASTATIC PART No.: NEEDLE	SHURE PART No.: CARTRIDGE	SHURE PART No.: NEEDLE	REMARKS
M1		LQD-1J	"Q" "Q-33			

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED.

CHASSIS—TOP VIEW



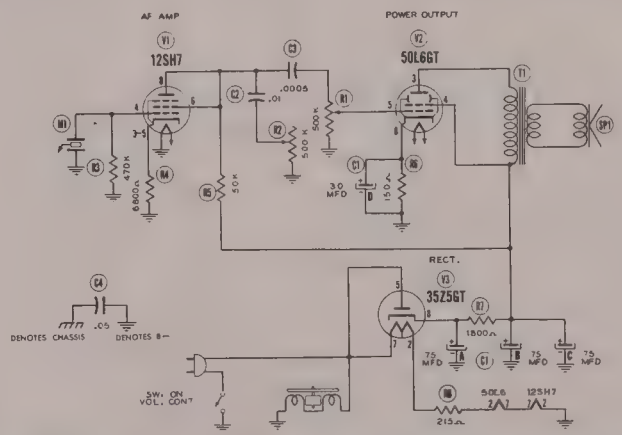
CHASSIS—BOTTOM VIEW



HUDSON
MODEL 347BL

HUDSON MODEL 347BL

TRADE NAME	Hudson, Model 347BL
MANUFACTURER	Hudson Electronics Corp., 110 E. 3rd St., Mt. Vernon, New York
TYPE SET	AC Operated Audio Amplifier
TUBES (THREE)	Types 12SH7 AF Amp., 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC RATING .23 Amp. at 117 Volts AC



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SH7	0V	0V	6.6VDC	0V	1.6VDC	45VDC	13VAC	45VDC
V 2	50L6GT	0V	85VAC	75VDC	80VDC	0V	0V	13VAC	4.7VDC
V 3	35Z5GT	0V	80VAC	85VAC	0V	117VAC	0V	117VAC	140VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SH7	Inf.	0Ω	6.8KΩ	470KΩ	6.8KΩ	1150KΩ	13Ω	1150KΩ
V 2	50L6GT	Inf.	65Ω	12KΩ	11.8KΩ	40Ω	Inf.	13Ω	150Ω
V 3	35Z5GT	Inf.	280Ω	290Ω	Inf.	300Ω	Inf.	300Ω	40KΩ

1 MEASURED FROM PIN 8 OF V3

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: HUDSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	AF Amp.	12SH7	12SH7	8BK	
V2	Power Output	50L6GT	50L6GT	7AC	
V3	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: HUDSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	75	150		AFH101010D4A		UP75T15C3		TVL-4425	▲ Filter
B	75	150							■ Filter
C	75	150							▲ Filter
D	30	25							Output Cathode
C2	.01	600		P688-01	D6-103	PTE6S1	821-01	6TM-S1	Tone Comp.
C3	.0005	600		1468-0005	D6-501	5W5T5	GP2K-500	6TM-T5	Audio Coupling
C4	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Line Isolation

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: HUDSON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½		Q13-133	AG-60-Z	B-60-S	Volume control
B	Shaft			Not req.	FS-3	Not req.	Attach to R1A per instructions
C	Switch			76-1	SWB	Not req.	Attach to R1A per instructions
R2A	500KΩ	½		Q13-133	AG-60-Z	B-60	Tone control
B	Shaft			Not req.	FS-3	Not req.	Attach to R2A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: HUDSON PART No.	IRC PART No.	IDENTIFICATION CODES
R3	470KΩ	½		BTS-470K	AF Amp. Grid
R4	6800Ω	½		BTS-6800	AF Amp. Cathode
R5	150KΩ	½		BTS-150K	AF Amp. Load
R6	150Ω	½		BTS-150	Output Cathode
R7	1800Ω	2		BTB-1800	Filter
R8	215Ω	10			Filament String - Wire Wound

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: HUDSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	22KΩ	3.9Ω	165Ω	.5Ω		A-3332 ①	A-2928 ①	RO-2 ①	① Bend mounting tabs down, file out slot and mount on original bracket.

SPEAKER

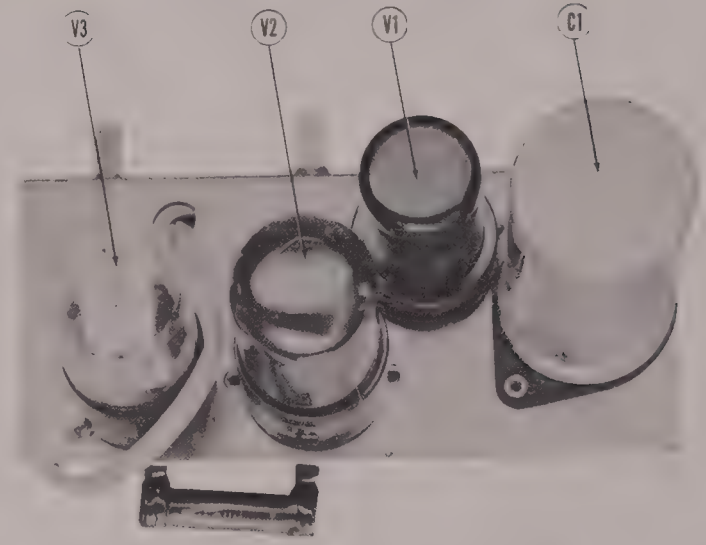
ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: HUDSON PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	PM	3.9Ω		5J4	5A07	
	CONE DIA.	V. C. DIA.				
SP2	5"	9/16"				

PHONO CARTRIDGE and NEEDLE

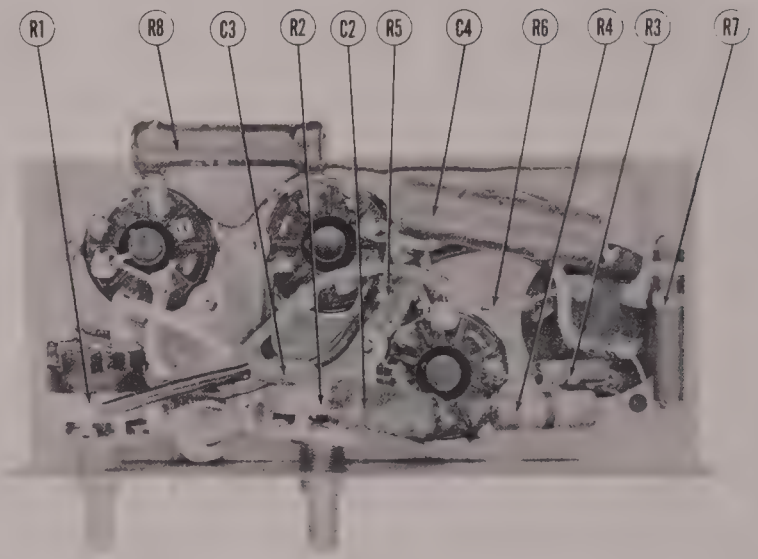
ITEM No.	REPLACEMENT DATA: HUDSON PART No.	ASTATIC PART No.: CARTRIDGE	ASTATIC PART No.: NEEDLE	SHURE PART No.: CARTRIDGE	SHURE PART No.: NEEDLE	REMARKS
M1		LQD-1J	"Q"			
		7-D †	"Q-33"	901D †		† Complete Arm Assembly

ASTATIC AND SHURE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

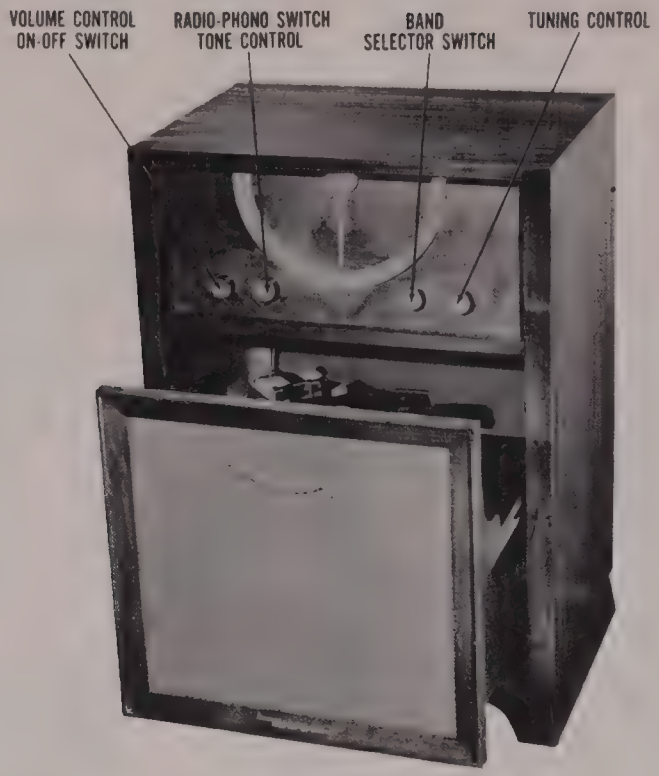
CHASSIS—TOP VIEW



CHASSIS—BOTTOM VIEW



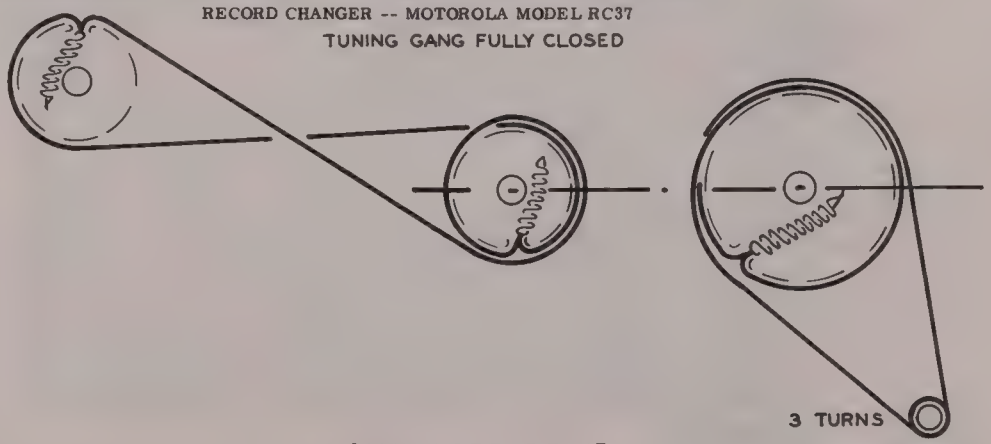
MOTOROLA
MODELS 8FM21, 8FM21B (Ch. HS-247)



MOTOROLA MODEL 8FM21

TRADE NAME	Motorola, Models 8FM21, 8FM21B (Ch. HS-247)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago, Illinois
TYPE SET	AC Operated Combination Phono-Radio, Superheterodyne Receiver with Loop Antenna
TUBES (EIGHT)	Types 6BA6 RF Amp., 6BA7 Converter, 6BA6 1st IF Amp., 6BA6 2nd FM IF Amp., 6AL5 Ratio Det., 6AV6 DET-AVC-AF, 6K6GT Power Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC — RATING .57 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	535-1620KC — FREQ. MOD. 88-108MC

RECORD CHANGER -- MOTOROLA MODEL RC37
TUNING GANG FULLY CLOSED



DIAL CORD DRIVE

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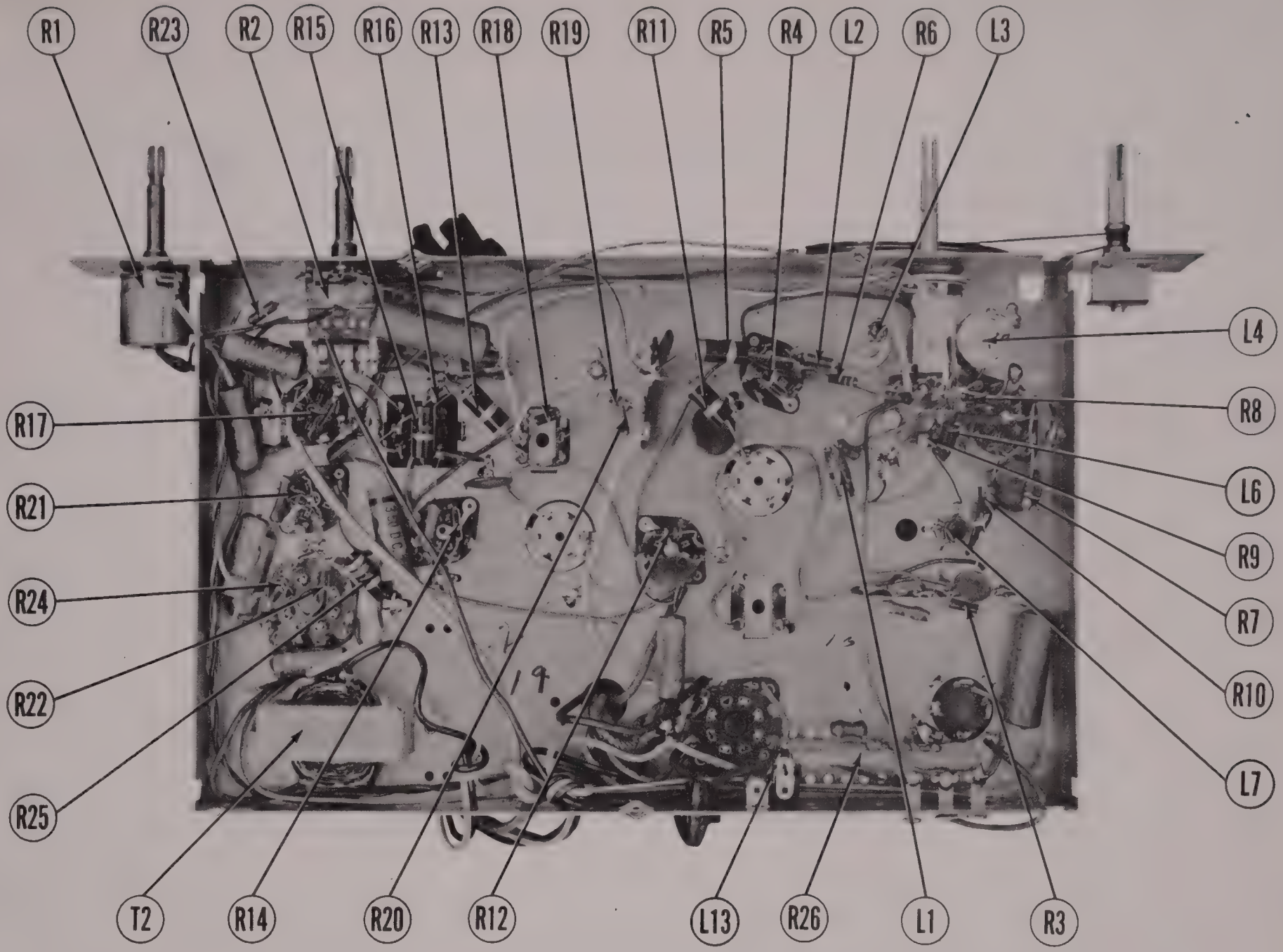
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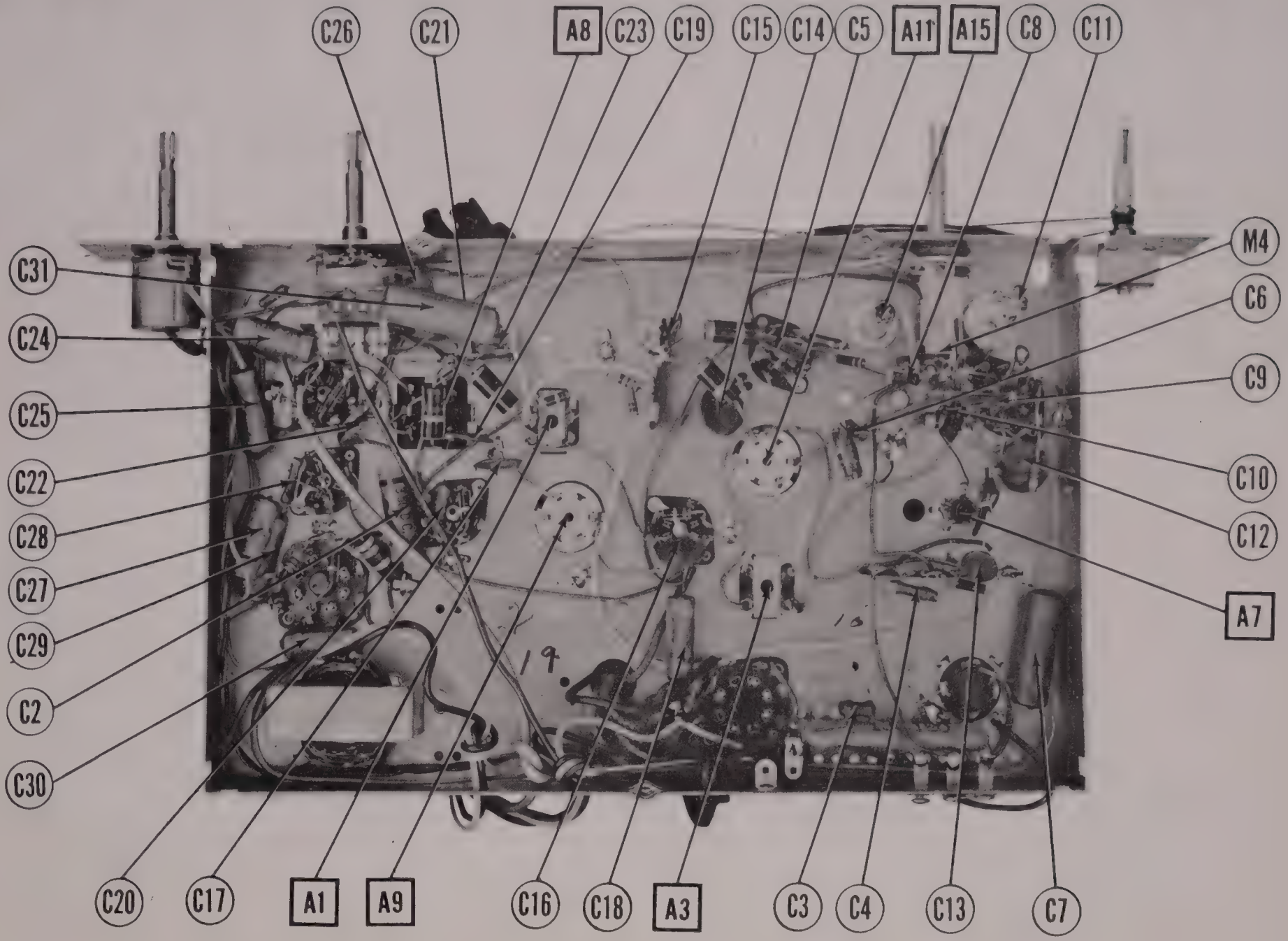
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C9
C25
C10
C22
C12
C28
A7
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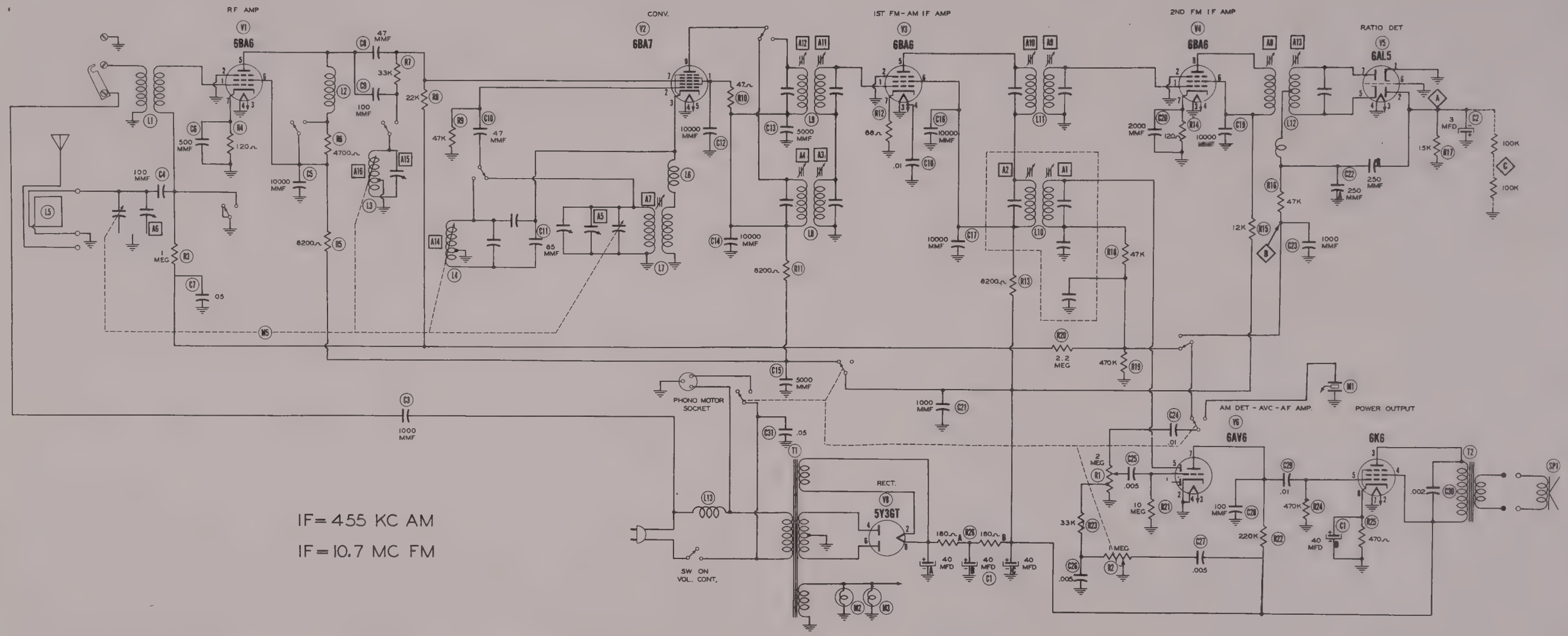

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BA6	‡0V #-.3VDC	0V	6.3VAC	0V	‡80VDC #70VDC	‡80VDC #100VDC	1.4VDC		
V 2	6BA7	85VDC	‡#-.5VDC #-6.6VDC	0V	0V	6.3VAC	0V	‡-.5VDC #-.3VDC	0V	85VDC
V 3	6BA6	0V	0V	0V	6.3VAC	85VDC	85VDC	1VDC		
V 4	6BA6	0V	0V	0V	6.3VAC	75VDC	75VDC	1.4VDC		
V 5	6AL5	0V	‡1.2VDC	6.3VAC	0V	‡-15VDC	0V	‡1.2VDC		
V 6	6AV6	-.6VDC	0V	6.3VAC	0V	‡-.7VDC #-1.6VDC	0V	110VDC		
V 7	6K6GT	0V	6.3VAC	180VDC	195VDC	0V	0V	0V	14VDC	
V 8	5Y3GT	0V	225VDC	117VAC	240VAC	0V	240VAC	0V	225VDC	

‡ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BA6	‡.2Ω #3.8 Meg.	0Ω	.1Ω	0Ω	‡†8.5KΩ #†13KΩ	†8.5KΩ	120Ω		
V 2	6BA7	†8.5KΩ	47KΩ	.5Ω	0Ω	.1Ω	0Ω	‡22KΩ #2.7 Meg	0Ω	†8.5KΩ
V 3	6BA6	20Ω	0Ω	0Ω	.1Ω	†8.5KΩ	†8.5KΩ	68Ω		
V 4	6BA6	.9Ω	0Ω	0Ω	.1Ω	†12KΩ	†12KΩ	120Ω		
V 5	6AL5	0Ω	15KΩ	.1Ω	0Ω	Inf.	0Ω	Inf.		
V 6	6AV6	10 Meg.	0Ω	.1Ω	0Ω	‡410KΩ #520KΩ	0Ω	†220KΩ		
V 7	6K6GT	Inf.	.1Ω	†1KΩ	†360Ω	470KΩ	0Ω	0Ω	470Ω	
V 8	5Y3GT	Inf.	40KΩ	Inf.	100Ω	Inf.	100Ω	Inf.	40KΩ	

† MEASURED FROM PIN 2 OF V8

RADIO-PHONO SWITCH IN RADIO POSITION
† TAKEN IN FM POSITION
# TAKEN IN AM POSITION

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial pointer, turn tuning gang fully closed and set the pointer horizontal at the low frequency end of the dial. To adjust the pointer loosen the pointer adjust set screw. Do not remove the nut on the front of the pointer.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (Grid) of 6BA7 (V2). Low side to chassis.	455KC (400∿ Mod.)	AM (CW)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	.1MFD	"	1620KC	"	"	"	A5	"
3.		Loop	1400KC	"	Tune for max. output	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

If the receiver is found to be badly off calibration, it will be necessary to perform step 4. The oscillator coil core has been sealed at the factory.

Adjustment of A7 should not be performed unless absolutely necessary to correct serious calibration error. If A7 is adjusted, repeat steps 3 and 4 several times, or until no further improvement can be made.

4.		Loop	535KC	AM (CW)	Tuning gang fully closed	Across voice coil	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

If the oscillator trimmer (A6) shows insufficient range adjust the trimmer on opposite side of tuning gang to 1/2 turn from tight.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (± 1%) resistors in series from point (A) to chassis. The junction of these two resistors is alignment point (C) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	.001MFD	High side to pin 7 (Grid) of 6BA7 (V2). Low side to chassis.	10.7MC (Unmod.)	FM (CCW)	Tuning gang fully open	DC Probe to Point (A). Common to chassis.	A9, A9, A10, A11, A12	Adjust for maximum deflection.
6.	.001MFD	"	"	"	"	DC Probe to Point (B). Common to Point (C).	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Continue with step 8.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	.001MFD	High side to pin 1 (Grid) of 6BA6 (V3). Low side to chassis.	10.7MC (450KC SWP)	FM (CCW)	Point on non-interference	Vert. Amp. to Point (A). Low side to chassis.	A8, A9, A10	Disconnect stabilizer capacitor C2. Adjust for maximum amplitude and symmetry as per figure 1.
6.	.001MFD	High side to pin 7 (Grid) of 6BA7 (V2). Low side to chassis.	"	"	"	"	A11, A12	"
7.	.001MFD	"	"	"	"	Vert. Amp. to Point (B). Low side to chassis.	A13	Reconnect capacitor C2. Adjust A13 so 10.7MC occurs at center of crossover lines as per figure 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	270Ω carbon res.	High side thru 270Ω to "FM" antenna terminal (open link). Low side to chassis.	87.5MC (Unmod.)	FM	Tuning gang fully closed	DC Probe to Point (A). Common to chassis.	A14	Adjust for maximum deflection.
9.	Turn tuning core A16 counter-clockwise until core is at bottom of pipe, and then 4 turns clockwise.							
10.	270Ω carbon res.	High side thru 270Ω to "FM" antenna terminal (open link). Low side to chassis.	90MC	FM	Tune for max. deflection.	DC Probe to Point (A). Common to chassis.	A15	Adjust for maximum deflection.
11.	"	"	105MC	"	"	"	A16	"

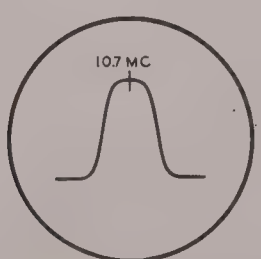


FIG. 1

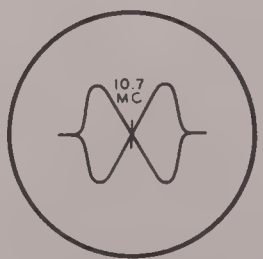


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6BA6	6BA6	7BK	
V2	Converter	6BA7	6BA7	8CT	
V3	1st FM-AM IF Amp.	6BA6	6BA6	7BK	
V4	2nd FM IF Amp.	6BA6	6BA6	7BK	
V5	Ratio Det.	6AL5	6AL5	6BT	
V6	Det.-AVC-AF	6AV6	6AV6	7BT	
V7	Power Output	6K6GT	6K6GT	7S	
V8	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	300	23B690975	AFH888G4D		UPT44435		TVL-4605	▲ Filter
B	40	250		PRS25/25		C4		TVA-1205	■ Filter
C	40	250							● Filter
D	40	25							Output Cath. Bypass
C2	3	50	23K690543	PRS150/4		BR550		TVA-1301	Stabilizing Cap.
C3	1000		21K478410	SI1000	D6-102	1W5D1	GP2L-001	19C1	Line Ant. Coupling
C4	100		21B77286	SI100	D6-101	5W5T1	GP1K-100	19C11	RF Coupling
C5	10000		21K482726	BPD-01	DD-103	PTE4S1	821-01	36C1	RF Amp. Dec.
C6	500		21K481377	SI500	D6-501	5W5T5	GP2K-500	19C32	RF Amp. Cath.
C7	.05	400	8R9816	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C8	47		21K77373	SI47	D6-470	5W5Q5	GP1K-47	19C25	RF Coupling
C9	100		21B77286	SI100	D6-101	5W5T5	GP1K-100	19C11	RF Coupling
C10	47		21K77373	SI47	D6-470	5W5Q5	GP1K-47	19C25	Osc. Grid Cap
C11	85		21A690688				N150K-85		Fixed Trimmer
C12	10000		21K482726	BPD-01	DD-103	PTE4S1	821-01	36C1	Osc. Anode Bypass
C13	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	29C1	Conv. Decoupling
C14	10000		21K482726	BPD-01	DD-103	PTE4S1	821-01	36C1	Conv. Decoupling
C15	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C16	10000		21K482726	BPD-01	DD-103	PTE4S1	821-01	36C1	1st IF Dec.
C17	10000		21K482726	BPD-01	DD-103	PTE4S1	821-01	36C1	1st IF Dec.
C18	.01	400	8R9809	P488-01	D6-103	PTE4S1	821-01	4TM-S1	1st IF Filter
C19	10000		21K482726	BPD-01	DD-103	PTE4S1	821-01	36C1	2nd IF Dec.
C20	2000		21K790912	SI2000	D6-202	1W5D2	GP2M-002	29C2	2nd If Cathode
C21	1000		21K478410	SI1000	D6-102	1W5D1	GP2L-001	19C1	RF Bypass
C22A	250		21B484337	SI250	D6-251	5W5T25	GP2K-250	19C13	Diode Load Cap *
B	250			SI250	D6-251	5W5T25	GP2K-250	19C13	Diode Load Cap *
C23	1000		21K478410	SI1000	D6-102	1W5D1	GP2L-001	19C1	De-emphasis
C24	.01	400	8R9809	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Audio Coupling
C25	.005	600	8R9813	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling
C26	.005	600	8R9813	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Tone Comp.
C27	.005	600	8R9813	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Tone Comp.
C28	100		21B77286	SI100	D6-101	5W5T1	GP1K-100	19C11	AF Amp. Plate
C29	.01	400	8R9809	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Audio Coupling
C30	.002	600	8R9847	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	Output Plate Bypass
C31	.05	400	8R490232	P488-05	DF-503	PTE4S5		4TM-S5	Line Filter

* When Either Item C22A Or C22B Are Replaced, Replace Both With Capacitors Of Equal Value.

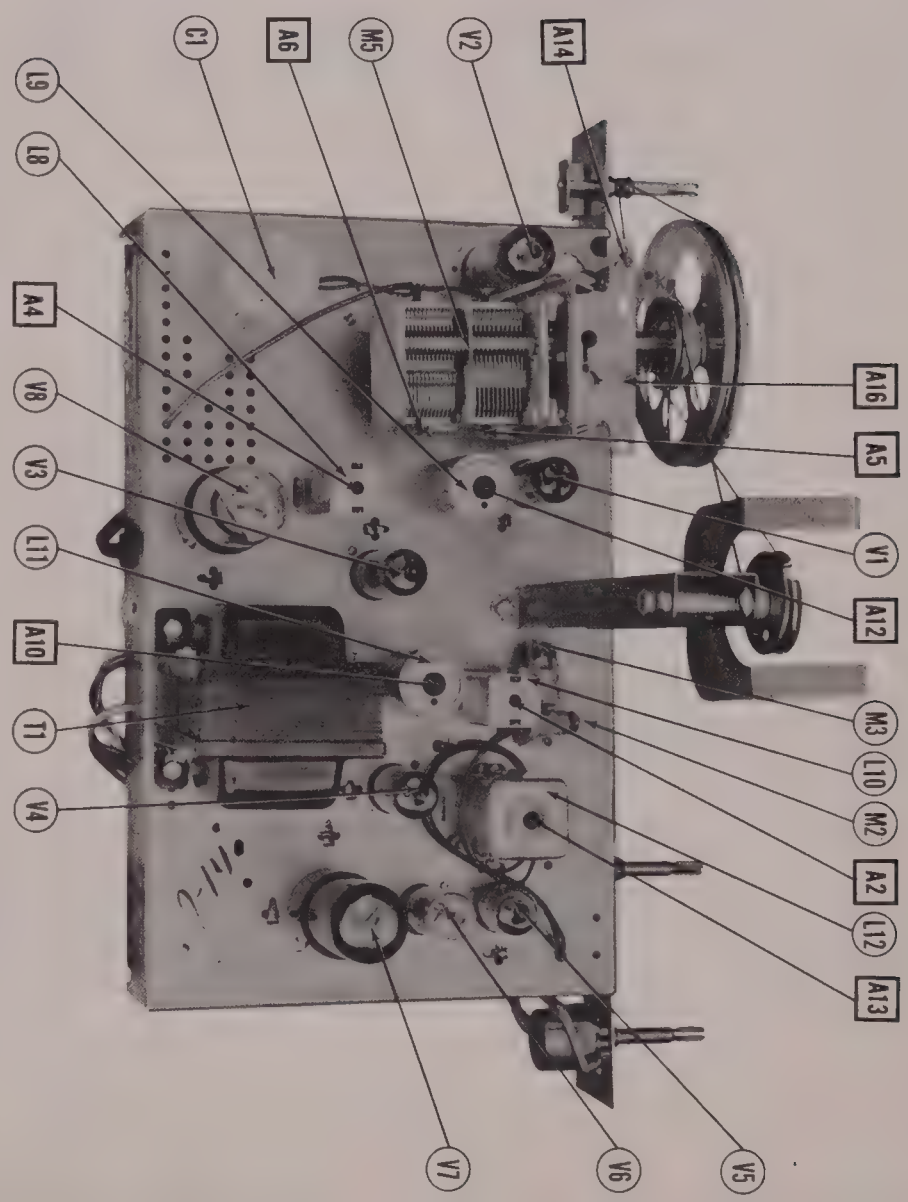
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	2Meg	1/2	18A600974	Q13-139X		BT-79-S *	Volume control and switch - Tap @ 400KΩ
B	Shaft		Not req.	Not req.		AK-116 *	Attach to R1A per instructions
C	Switch		Not req.	76-1		Not req.	Attach to R1A per instructions
R2	1Meg	1/2	18B600683				Tone control and radio - phono switch

Use Coupler With Original Shaft To Obtain Desired Length.

SET 121 FOLDER 9

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6BA6	6BA6	7BK	
V2	Converter	6BA7	6BA7	8CT	
V3	1st FM-AM IF Amp.	6BA6	6BA6	7BK	
V4	2nd FM IF Amp.	6BA6	6BA6	7BK	
V5	Ratio Det.	6AL5	6AL5	6BT	
V6	Det.-AVC-AF	6AV6	6AV6	7BT	
V7	Power Output	6K6GT	6K6GT	7S	
V8	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	300	23B690975	AFH888G4D		UPT44435		TVL-4605	▲ Filter
B	40	250		PRS25/25		C4		TVA-1205	■ Filter
C	40	250							● Filter
D	40	25							Output Cath. Bypass
C2	3	50	23K690543	PRS150/4		BR550		TVA-1301	Stabilizing Cap.
C3	1000		21K478410	SI1000	D6-102	1W5D1	GP2L-001	19C1	Line Ant. Coupling
C4	100		21B77286	SI100	D6-101	5W5T1	GP1K-100	19C11	RF Coupling
C5	10000		21K482726	BPD-01	DD-103	PTE4S1	821-01	36C1	RF Amp. Dec.
C6	500		21K481377	SI500	D6-501	5W5T5	GP2K-500	19C32	RF Amp. Cath.
C7	.05	400	8R9816	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C8	47		21K77373	SI47	D6-470	5W5Q5	GP1K-47	19C25	RF Coupling
C9	100		21B77286	SI100	D6-101	5W5T5	GP1K-100	19C11	RF Coupling
C10	47		21K77373	SI47	D6-470	5W5Q5	GP1K-47	19C25	Osc. Grid Cap
C11	85		21A690688				N150K-85		Fixed Trimmer
C12	10000		21K482726	BPD-01	DD-103	PTE4S1	821-01	36C1	Osc. Anode Bypass
C13	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	29C1	Conv. Decoupling
C14	10000		21K482726	BPD-01	DD-103	PTE4S1	821-01	36C1	Conv. Decoupling
C15	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C16	10000		21K482726	BPD-01	DD-103	PTE4S1	821-01	36C1	1st IF Dec.
C17	10000		21K482726	BPD-01	DD-103	PTE4S1	821-01	36C1	1st IF Dec.
C18	.01	400	8R9809	P488-01	D6-103	PTE4S1	821-01	4TM-S1	1st IF Filter
C19	10000		21K482726	BPD-01	DD-103	PTE4S1	821-01	36C1	2nd IF Dec.
C20	2000		21K790912	SI2000	D6-202	1W5D2	GP2M-002	29C2	2nd If Cathode
C21	1000		21K478410	SI1000	D6-102	1W5D1	GP2L-001	19C1	RF Bypass
C22A	250		21B484337	SI250	D6-251	5W5T25	GP2K-250	19C13	Diode Load Cap *
B	250			SI250	D6-251	5W5T25	GP2K-250	19C13	Diode Load Cap *
C23	1000		21K478410	SI1000	D6-102	1W5D1	GP2L-001	19C1	De-emphasis
C24	.01	400	8R9809	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Audio Coupling
C25	.005	600	8R9813	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling
C26	.005	600	8R9813	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Tone Comp.
C27	.005	600	8R9813	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Tone Comp.
C28	100		21B77286	SI100	D6-101	5W5T1	GP1K-100	19C11	AF Amp. Plate
C29	.01	400	8R9809	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Audio Coupling
C30	.002	600	8R9847	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	Output Plate Bypass
C31	.05	400	8R490232	P488-05	DF-503	PTE4S5		4TM-S5	Line Filter

* When Either Item C22A Or C22B Are Replaced, Replace Both With Capacitors Of Equal Value.

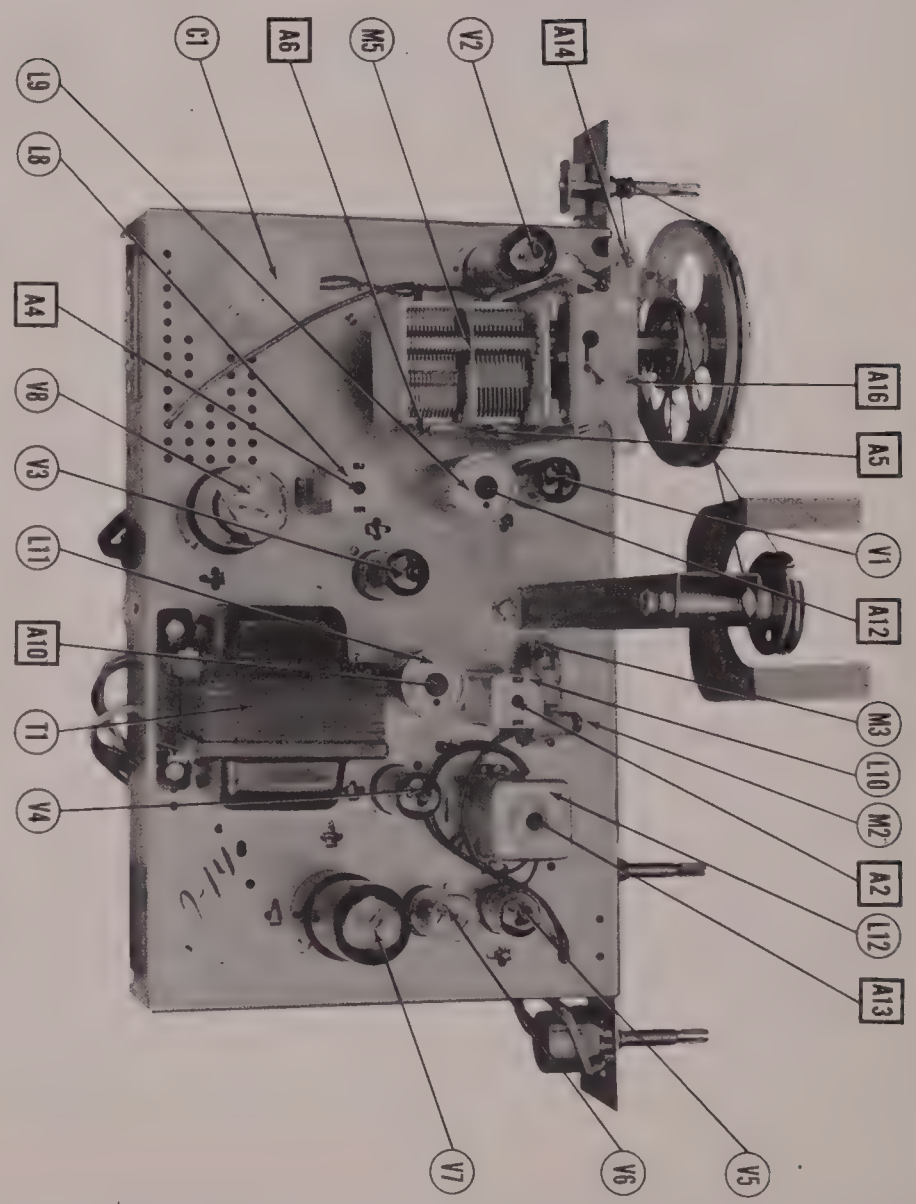
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	2Meg	½	18A600974	Q13-139X		BT-79-S *	Volume control and switch - Tap @ 400KΩ
B	Shaft		Not req.	Not req.		AK-116 *	Attach to R1A per instructions
C	Switch		Not req.	76-1		Not req.	Attach to R1A per instructions
R2	1Meg	½	18B600683				Tone control and radio - phono switch

Use Coupler With Original Shaft To Obtain Desired Length.

SET 121
FOLDER 9

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	
R3	1Meg	1/2	6R6004	BTS-1Meg	AVC Network
R4	120Ω	1/2	6R5551	BTS-120	RF Amp. Cathode
R5	8200Ω	2	6R5725	BTB-8200	RF Amp. Decoup.
R6	4700Ω	1/2		BTS-4700	RF Amp. Plate - See Note 1
R7	33KΩ	1/2	6R6410	BTS-33K	AVC Network
R8	22KΩ	1/2	6R6028	BTS-22K	Converter Grid
R9	47KΩ	1/2	6R6056	BTS-47K	Osc. Grid
R10	47Ω	1/2	6R2108		Parasitic Supp
R11	8200Ω	2	6R5725	BTB-8200	Decoup.
R12	68Ω	1/2	6R2039		1st IFAmp. Cathode
R13	8200Ω	2	6R5725	BTB-8200	1st IF Amp. Decoup.
R14	120Ω	1/2	6R5551	BTS-120	2nd IF Amp. Cathode
R15	12KΩ	2		BTB-12K	2nd IF Amp. Decoup.- See Note 2
R16	47KΩ	1/2	6R6056	BTS-47K	De-emphasis
R17	15KΩ	1/2		BTS-15K	Ratio Det. Diode Load - See Note 3.
R18	47KΩ	1/2	6R6056	BTS-47K	AVC Diode Filter
R19	470KΩ	1/2	6R6032	BTS-470K	AVC Network
R20	2.2Meg	1/2	6R3927	BTS-2.2Meg	AVC Network
R21	10Meg	1/2	6R2109	BTS-10Meg	AF Amp. Grid
R22	220KΩ	1/2	6R6015	BTS-220K	AF Amp. Plate
R23	33KΩ	1/2	6R6410	BTS-33K	Tone Compensation
R24	470KΩ	1/2	6R6032	BTS-470K	Output Grid
R25	470Ω	2	6R5593	BTB-470	Output Cathode
R26A	180Ω	3	17A690973		Filter - Wire Wound
B	180Ω	3			Filter - Wire Wound

Note 1. Some Models Use 1800Ω Resistor In This Application.
Note 2. Some Models Use 15KΩ Resistor In This Application.
Note 3. Some Models Use 33KΩ Resistor In This Application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ .57A	510VCT .078ADC	5VAC @ 2A	6.3VAC @ 2.2A	25B600684	PC8403	P-3151 ① ②	PV-60 ①

① Drill New Mtg. Holes.
② Add Series Resistor To Reduce Voltage.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	8KΩ	3.8Ω	700Ω	.8Ω	25B600969	A-3878 ①	A-3020	RO-13 ①	① Drill new mtg. holes.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	3.8Ω	50C601038	ST-117 Mod. P8-T	8A31	
	CONE DIA.	V. C. DIA.				
SP2	7 1/4"	1"				

PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
L1	FM Ant. Trans.	.2Ω	.2Ω	24A690544		
L2	RF Choke	.1Ω		24A90064		
L3	FM RF Coil	0Ω		24C690584		
L4	FM Osc. Coil	0Ω		24K600519		
L5	Loop Ant.	2.8Ω		24C690896		
L6	RF Choke	0Ω		24A791081		
L7	AM Osc. Coil	.4Ω	8.8Ω	24K691878	14-1073	White And Red Dots
L8	1st AM IF	19Ω	19Ω	24B485553	16-6758	Green Dot
L9	1st FM IF	2Ω	.9Ω	24B690540	16-3487	Orange Dot Less Shield
L10	2nd AM IF	17Ω	17Ω	24K485555	16-6770	Pink Dot
L11	2nd FM IF	5Ω	.9Ω	24B690541	16-3487	Yellow Dot Less Shield
L12	Ratio Det. Trans.	2.2Ω	.4Ω	24K600893		
L13	RF Choke	0Ω		24A692148		

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA					REMARKS
	MOTOROLA PART No.	ASTATIC PART No.		SHURE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	59K691907	AC-AG-J	A-AG	W26B	A66U	

ASTATIC AND SHURE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					MOTOROLA PART No.		
M2	Bayonet	6-8	.25	Blue	65X10867		Type Number 44
M3	Bayonet	6-8	.25	Blue	65X10867		Type Number 44

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	Switch	40B690538	AM-FM
M5	2 Gang Var. Cap	19B691877	(29-485MMF, 33-181MMF)
	Cabinet	16F600649	Model 8FM21
	Cabinet	16K600650	Model 8FM21B
	Dial Scale	34D600819	
	Knob	36K601052	Vol.- On ~ Off
	Knob	36K601056	Phono-Tone-Radio
	Knob	36K601057	AM-FM
	Knob	36K601055	Tuning
	Knob	36K601058	Vol.-On-Off
	Knob	36K601063	Phono-Tone-Radio
	Knob	36K601064	AM-FM
	Knob	36K601062	Tuning

SILVERTONE
MODEL 70 (Ch. 567.230, 567.231)

SILVERTONE
MODEL 70 (Ch. 567.230, 567.231)

GENERAL INFORMATION

The Silvertone Model 70 is a complete, self-contained wire recorder with a built-in timer which reads in seconds and minutes. The timer proves helpful from an editing standpoint in making notations as to elapsed time when programs of special interest are being recorded. Recordings may be made on recording wire from its own microphone, from an external record changer, or from a radio with the use of connecting cables. Many Silvertone models have a special recording jack for high fidelity recordings direct from the radio. Recordings may be played back through the self-contained speaker or by using the connecting cables through the phonograph jack of an AC type radio.

A recording will last indefinitely, since the playback process has no effect on the wire; or, the new recordings may be made on an old spool inasmuch as, in the recording process, any previous recording is erased.

The power supply is 105-120 volts, 60 cycles AC only.

Manufactured by: Sears, Roebuck & Co.,
926 S. Homan Street, Chicago, Illinois

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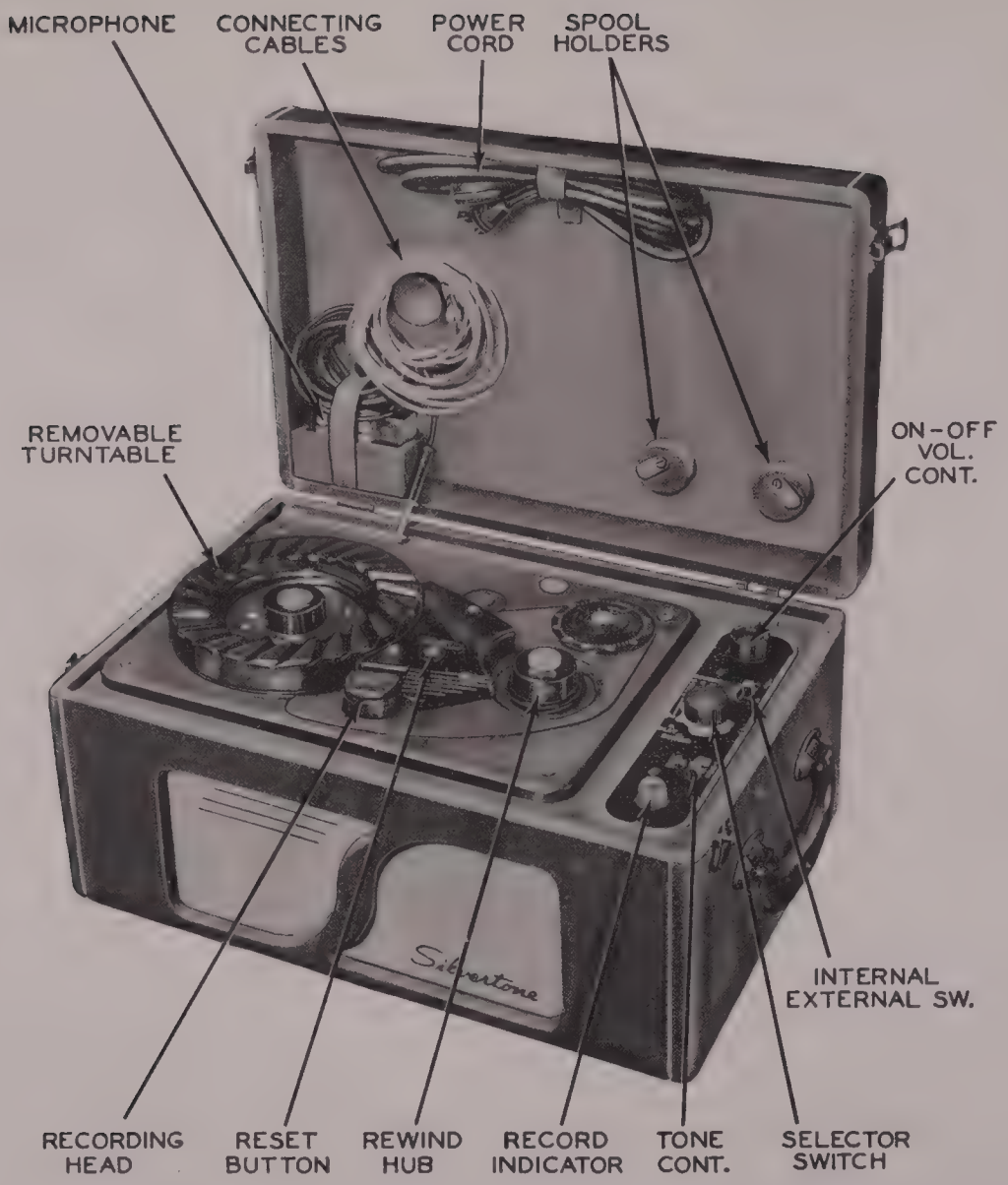


OPERATING INSTRUCTIONS

Preparing for Operation:

1. Remove the top cover.

2. Insert the power cord through the opening in the rear of the case, and plug the other end into a convenient wall receptacle.

Threading of Wire:

1. Proper placement of wire on the machine is very important, as "Wows" may result from improper procedure.

Proceed as follows:

1. Turn the Off-On-Level control clockwise until a snap is heard. This turns the unit on. This control serves as an off-on control, and also the volume level when making a recording. It also serves as a volume control on the playback of a recording.

2. Turn the Selector Switch to Rewind.

3. Press the Reset Button (7) located on the Switch Housing (8). The Rewind Hub (3) (on the top, at the right end of the mechanical unit) will revolve and the Recording Head (12) will move up and down. Stop the Recording Head at the top of its travel. This is done by drawing a finger over the manual Trip Lever (7A) appearing in the slot located near the Reset Button. (See Figure No. 2.)

4. Place the spool (Label side up) and press on the spool until it is firmly seated on the Rewind Hub (3).

5. Grasp the end of the tape leader and carefully pull it past the Recording Head (12). Place the tape leader in the channel in the Take-up Drum (1). While holding the leader against the inner edge of the channel rotate the Take-up Drum (1) by hand until two complete turns of wire are in the channel. The full length of the leader must be pressed against the inner surface of the channel or speed variations, or wire tangle, may result. Make sure the wire is in the groove of the recording head.

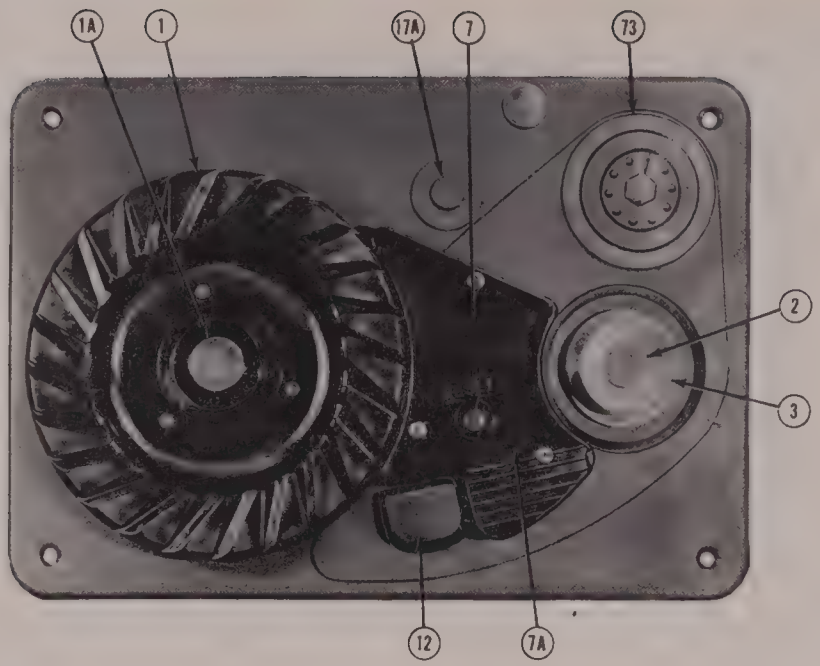


Figure 2

Setting Timer:

Rotate the minute indicator (outer dial) and the second indicator (inner dial) to the zero location.

The Timer (73) will accurately time and meter the recording. It may prove helpful, from an editing standpoint in making notations as to the elapsed time when recordings of special interest are recorded. If this procedure is followed, it is easy to predetermine their location on the wire for playback.

To Record from Microphone:

Put wire on the mechanism as covered under "Threading of Wire."

1. Insert the microphone plug into its proper jack, as indicated on the rear of case.

2. Push down on the record safety lock located under the selector knob; then turn the selector knob to "Rec.-Mike."

3. Turn the level control switch clockwise until sounds being fed into the microphone cause the "indicator" lamp to flash faintly on loud peaks only. The recorder is now ready to record from the microphone and should need no further attention.

4. Depress the Reset Button (7). This will cause the wire to move and to record.

NOTE: Never hold the microphone closer than eight inches to the mouth, as breathing may be picked up and recorded on the wire.

Radio programs may also be recorded, through the microphone, by placing the microphone about eight inches from the radio speaker; however, the results from this type recording will not be equal, in quality, to a recording made by means of a shielded cable connection. (See connections to radio, Figures Nos. 5 and 6.)

To Record from an External Record Player:

1. Insert the pick-up lead connector, from the pick-up cartridge of the external record player, into the receptacle located in the rear of recorder marked "Phono."

2. Press down the record safety lock and turn the Selector Switch to "Rec.-Phono;" then follow the regular procedure for recording, the same as for microphone recording.

Connections to Radio:

Recording of radio programs can be made using three methods of pick-up.

1. Place the microphone in front of the speaker and record as for regular microphone use.

2. The bare ends of the connector cable may have small clips attached for clipping across the speaker voice coil of AC type radios only. (See Figure No. 7.)

NOTE: Do not use this method on an AC DC type chassis.

3. For full high fidelity recordings, a radio service man can make the following circuit change for direct connection to the recorder by means of connecting cables as follows:

(A) Solder resistor network, consisting of one meg. and five meg. resistors in series, across the two outside terminals of the volume control on the radio, making certain that the one meg. resistor is connected

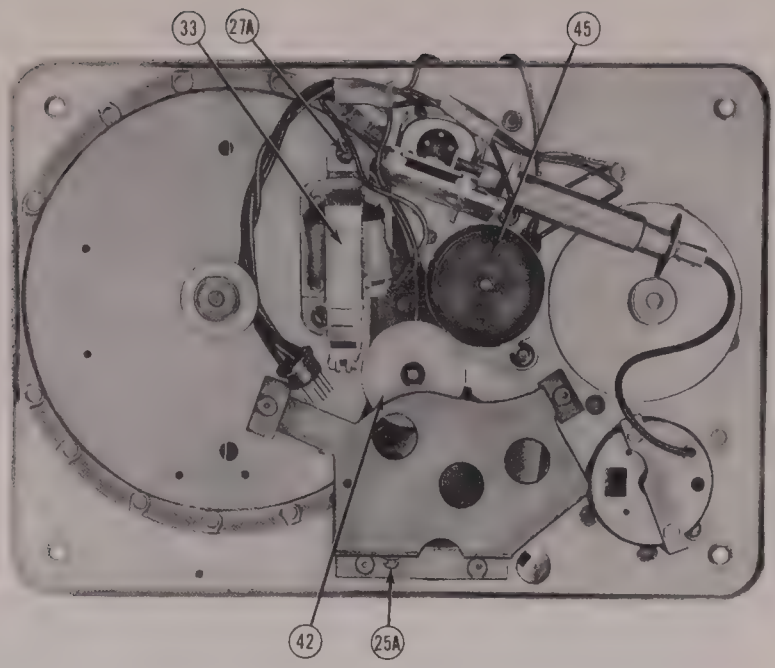


Figure 3

to the ground side of the control. (See Figure No. 5.)

Then solder bare end of cable to junction of the two resistors. The other end of cable should be plugged into the receptacle marked "radio" on the back of your recorder.

CAUTION: If the radio is used to make recordings only, the ground shield of the cable must be grounded as shown in Figure No. 6; however, if your radio is being used for both playback and recording, the phono input cable with phono plugs on each end is used to connect the "output" receptacle of the recorder to the phono "input" receptacle of the radio. Therefore, using these two cables, the latter cable grounds the two chassis and it is not necessary to ground the radio signal cable shield as shown in Figure No. 6. To do so may introduce a ground loop, with resultant hum.

(B) Turn the selector switch to "play" position.

(C) Turn the level control on and wait until the "record" indicator lights up; then press the safety lock and turn the selector switch to "Rec.-Radio."

(D) Tune in the desired radio program.

(E) Turn the level control clockwise until sounds being fed into the recorder cause the "Indicator Lamp" to flash faintly on loud peaks only. The recorder is now ready to record from the radio and should need no further attention.

(F) Depress the "Reset" Button (7). This will cause the wire to move and to record.

2. To play a recording through the radio:

(A) The cable having a phono plug on each end is used to play a recording through the audio system of your radio. The wire recorder will provide an input signal of fine tone quality and wide frequency range by connecting this cable from the "Output" jack of the recorder to the phono input connection of your radio-phonograph combination.

(B) Thread the wire on the recorder as described under "Threading of Wire."

(C) Move the "Ext-Int" switch to "Ext" position.

(D) Turn the selector switch to "Play" position.

(E) Rotate the level control switch on the recorder to full clockwise position. The volume of the recording will then be determined by the volume control on your radio.

(F) Depress the Reset Button (7). The recorder is now in operation and the program will be heard through your radio.

TO PLAY A RECORDING THROUGH ITS SELF-CONTAINED SPEAKER

1. Thread the wire as described under "Threading of Wire."

2. Turn the Selector Switch to "Play."

3. Move the "Ext-Int" Switch to "Int."

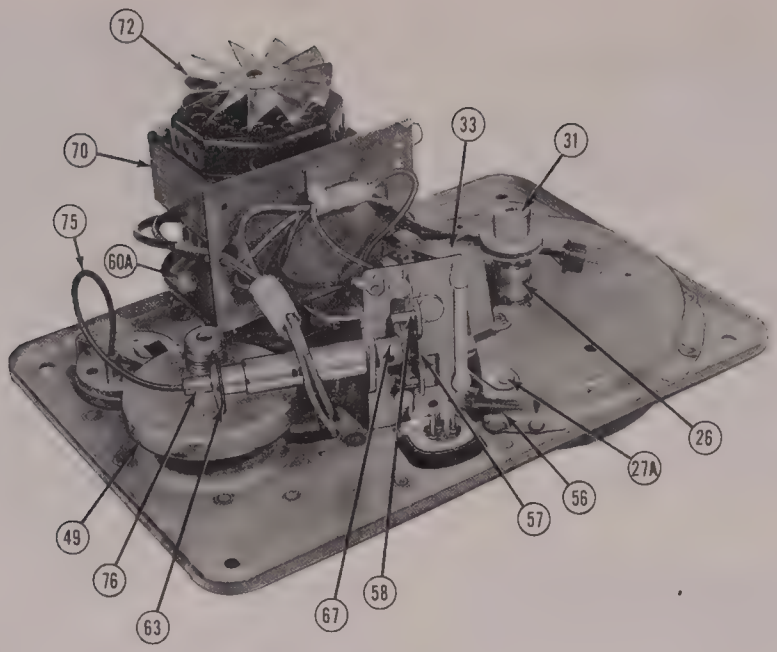


Figure 4

4. Turn the On-Off-Level control on and wait until the "Indicator" lamp lights up.

5. Depress the Reset Button (7).

6. Adjust the On-Off-Level control to the desired volume.

7. Move the Tone Control Switch to suit.

Automatic Trip Switch:

Running either in the forward or rewind direction, the plastic tape leaders connected to the ends of the wire will automatically turn the mechanism off by tripping the automatic trip switch (9).

NOTE: In case the plastic leader fails to actuate the automatic trip switch, pull a finger over the manual Trip Lever (7A) located on the switch housing.

Rethread and Rewind the Wire:

1. Unwind the tape leader from the removable Take-up Drum (1) and carefully pull it past the Recording Head (12).

2. Place the tape leader in the channel of the storage spool. While holding the leader against the inner edge of the channel, rotate the storage spool by hand, until two complete turns of wire are in the channel. The full length of the tape leader must be pressed against the inner surface of the channel or wire tangle may result.

3. Turn the Selector Switch to "Rewind."

4. Depress the Reset Button (7). The mechansim will automatically shut off when the wire is completely rewound on the storage spool.

NOTE: However, this does not shut off the amplifier and it will be necessary for you to turn the Off-On volume control completely counterclockwise until you hear the switch snap off.

Erasing a Recording:

Erasing an old program off wire is automatic when you record a new program. Should you wish to erase a program without putting a new program in its place, go through the normal recording procedure with the selector switch in one of the record positions, but have the level control set at full counterclockwise position but not off. If a portion of a recording is to be erased and the remainder of the recorded material is to be left on the wire, proceed in the following manner:

1. Note the time (beginning to end), of the recording to be erased as indicated by the Timer (73).

2. Rewind the wire to the starting point and proceed to record in the usual manner using the trip lever to start and stop the mechanism. The volume knob should be at minimum (counterclockwise) during this erasing time. This portion of the wire is now left entirely blank and a new recording may be entered in its place later.

NOTE: When a recording is made, the previous recording is automatically erased. The same procedure as above may be followed but a new recording section inserted without previously erasing the wire, being careful to watch the time.

SUMMARY

Red Reset Button:

The Reset Button (7) must be depressed for the mechanical unit to operate. This button pops up

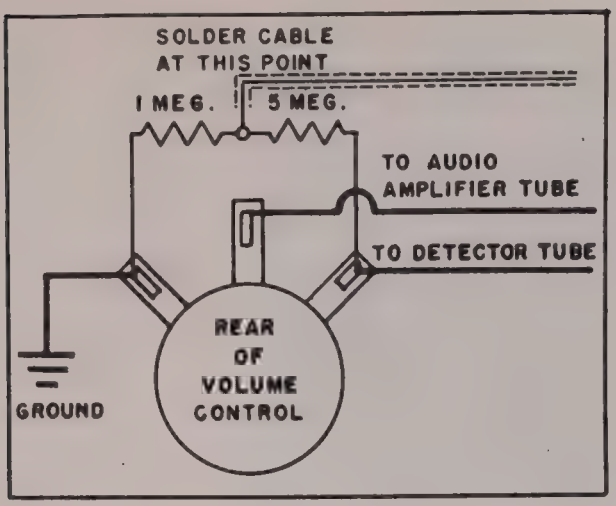


Figure 5

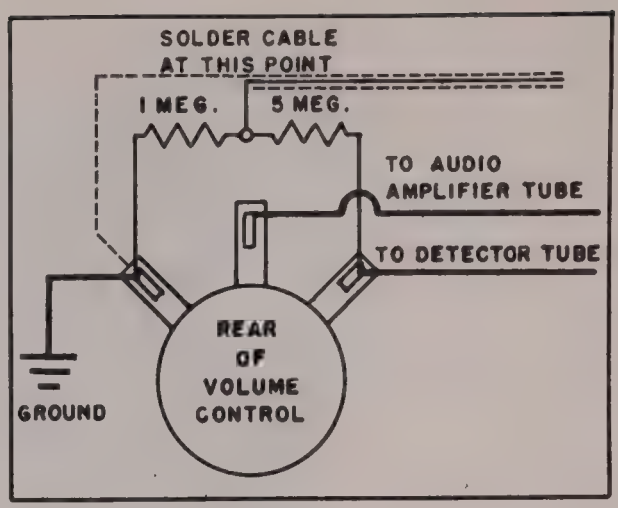


Figure 6

when the tape leader on the end of the wire comes in contact with the automatic shut-off switch (9), or when the manual Trip Lever (7A) located to the right of the reset button is moved.

Manual Trip Lever:

The manual Trip Lever (7A) is a small protruding lever extending through the Switch Housing (8) and located at the right of the Reset Button (7). By drawing a finger over this lever the movement of wire is stopped at any desired position, turning off the mechanism. The Reset Button (7) pops up when this lever is actuated.

Timer:

The Timer (73) proves helpful, from an editing standpoint in making notations as to elapsed time when programs of special interest are being recorded or edited or for inserting in other material.

Record Indicator (Lamp Indicator):

The record indicator determines the extent to which the Off-On-Level control is to be turned when making recordings. The Off-On-Level control should be adjusted to the point where this light flickers faintly on high peaks only during recording. This lamp burns continuously during rewind and play position and acts as a pilot light to let you know that your unit is on.

Tone Control Switch:

The Tone Control Switch is a three position slide switch. This is for selecting the tone of the recording during the play-back. The Tone Control does not function during the recording process.

Selector Switch:

The Selector Switch is a five-position switch. One rewind, one play and three record positions. Number one, "Record Phono" is used when recording from an external record player. Number two, "Record Radio" is used when recording from a radio. Number three, "Record Mike" is used for microphone recordings.

Ext-Int Switch:

This switch is a two-position slide switch. When this switch is in "Int" position, the recording will play through its own amplifier. When in "Ext" position, the recording will play through the audio system of your radio with the use of the connecting cables.

Off-On-Level Control:

This control serves a three-fold purpose.

1. Turns recorder unit on.
2. Adjusts level to which a recording is made.
3. Adjusts volume when a recording is played.

Usage of Take-up Drum:

The Silvertone Model 70 uses a removable Take-up Drum which enables you to remove and store the wire at any time or permits you to make quick changes of wire when recording or playing back. To store the wire on the removable Take-up Drum, place the index finger of the left hand behind the wire to the left of the Recording Head (12). Pull the wire forward approximately 2-1/2". Remove the storage spool from the Rewind Hub and move it toward the front of the machine. Now rotate the removable Take-up Drum clockwise to take up the wire between it and the spool, and lay the wire in one of the serations of the Take-up Drum. Place the storage spool in the center of the drum. During this operation the wire must be kept taut and free from any kinks, so as to avoid loose and broken wire. The Take-up Drum may now be removed and stored in a convenient place for later use.

MECHANICAL ALIGNMENT

Cam and Gear Adjustments:

1. Loosen the Set Screw (68) holding the Cam (67).

2. Insert a .006" feeler gauge between the Gear Shoulder (63) and the Shaft Housing (61).

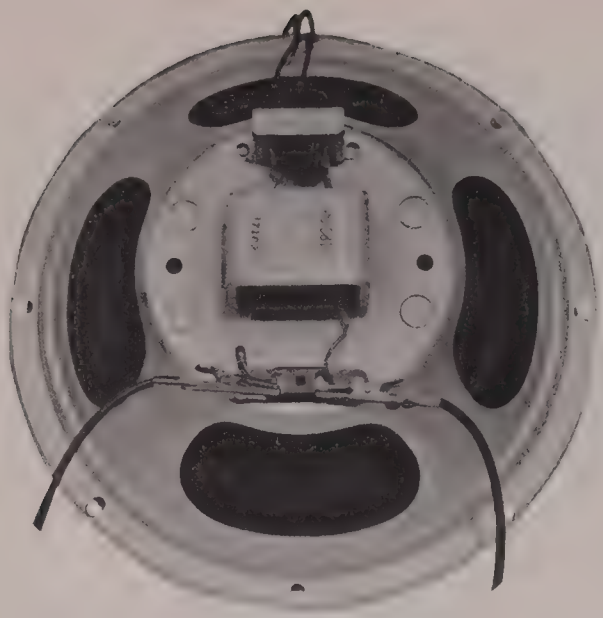


Figure 7

3. Push the Cam (67) and the Shaft and Gear Assembly (63) toward each other until all play is taken up.

4. Tighten the Cam Set Screw and remove the feeler gauge.

Worm and Gear Adjustment:

Hold the Fiber Gear (63) with one hand and rotate the Rewind Pulley (49) with the other. Check the clearance between the fiber gear and worm of the Rewind Pulley (49) at least every 90° rotation of the Fiber Gear. The clearance should be as little as possible without causing drag or binding.

Make Adjustment as Follows:

1. Remove the Switch Housing (8).

2. Loosen the Mounting Screws (22) of the Level Wind Frame (69) about 1/4 to 1/2 turn.

3. Move the entire assembly until the proper adjustment is made.

4. Tighten the mounting screws, then recheck for gear clearance.

5. Rotate the Rewind Hub (3) so the slide assembly will go through its entire stroke to be sure the Recording Head (12) does not bind on the edge of the hole in the mounting board.

6. Replace the switch housing.

Turntable Torque Adjustment:

Proper adjustment of the Turntable Torque is very important. Insufficient torque will result in inconsistent turntable speed, causing "Wow." Too much torque will result in wire breakage when switching from "Rewind" to "Play."

1. With the power connected, place the unit in "Play" position.

2. Loosen the Locknut on the Adjustment Screw (25A) in the motor mounting bracket (25).

3. If the Turntable (1B) does not rotate, turn the Adjustment Screw counterclockwise until the Idler Drive Pulley (2) barely makes contact with the lower section (1B), but enough to allow the Turntable to rotate.

4. If the Turntable is rotating, turn the screw clockwise until the Turntable stops rotating; then back the Screw out until the Idler Drive Pulley barely makes contact with the lower section (1B), but enough to allow the Turntable (1B) to rotate.

5. After this adjustment is made, turn the Adjustment Screw counterclockwise 3/4 turn.

6. Tighten the locknut, being careful not to turn the Adjustment Screw.

Level Wind Adjustment:

1. Rotate the Rewind Hub (3) until the Recording Head (12) is in its extreme downward position. In this position, the wire slot in the recording head should be approximately .020" above the Motor Board (17). If the wire is too high or too low, with respect to the Motor Board, it may be adjusted by slight bending of the Level Wind Slide (59).

2. The Reset Switch Arm, which is fastened to the top of the Switch Housing (8), should be 15/32" from raised section on the Motor Board under Switch Lever Finger (9). This may be adjusted by bending the Arm.

3. Thread on a spool of wire and let it wind on the Take-up Drum for 15 or 20 minutes. Observe how the wire lies in the channel of the Take-up Drum. With the proper adjustment, the wire should be even all the way across the channel. If the wire piles up in the top of the channel of the Take-up Drum, remove the Turntable (1B) and add washers (1C) until the condition is corrected. If the wire piles up in the bottom of the channel, washers should be removed.

4. Rewind the wire on the storage spool and observe how the wire lies on the spool. If the wire piles up on the top of the spool, remove the Hub Assembly and add Washers (15) until this condition is corrected. If the wire piles up on the bottom of the spool, washers should be removed.

Rewind Spindle Assembly End Play:

1. Tighten Hub Lock Screw (2) securely.

2. Loosen Set Screw (50) in the Pulley Assembly (49).

3. Place a .006 feeler gauge between Pulley Assembly (49) and Fibre Washer (100), then take up all the play between Shaft Assembly (14) and Pulley Assembly (49).

4. Tighten Set Screw (32) and remove the gauge.

Turntable Assembly End Play:

1. Loosen the Set Screw (32).

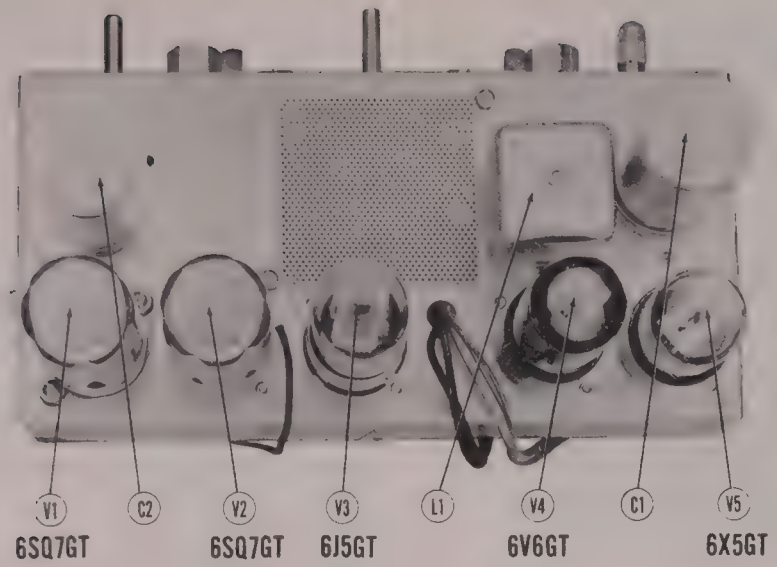


Figure 8

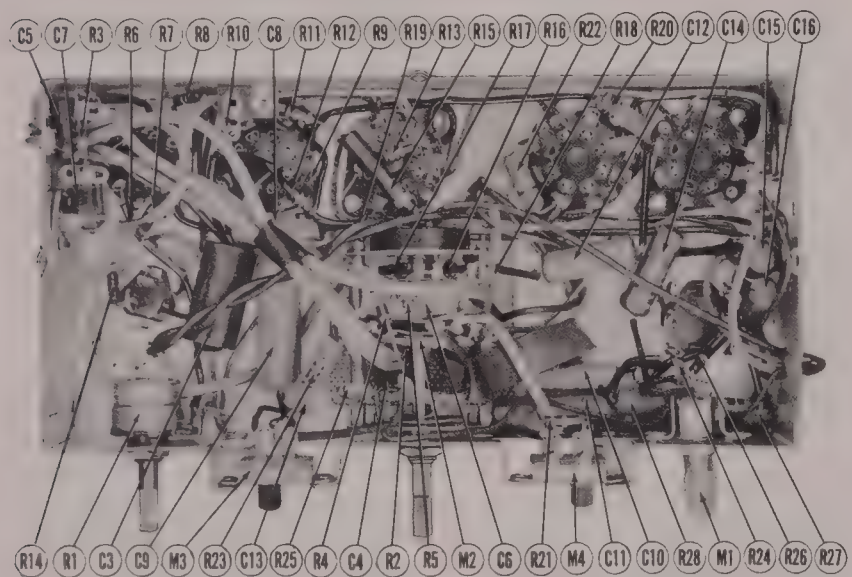


Figure 9

2. Push the Felt Washer (30) and the Keyed Washer (28) up out of the way.

3. Place a .006" feeler gauge between the Turntable Support (31) and the end of the bearing.

4. Push down on the Turntable Assembly (1B) and up on the Turntable Support (31) until all end play is removed.

5. Tighten the Set Screw (32) and remove the gauge.

LUBRICATION

Factory lubrication should be sufficient for a long period of service; however, should it become necessary to lubricate the recorder, do so as follows:

Use Automotive type lubricant such as Marfak No. 3 or Andok B and it should be applied to the following points. Do not use oil.

1. Pins of the Bracket and Post Assembly (18).

2. Washers (21).

3. The worm gear of the Rewind Pulley Assembly (49).

4. The shaft of the Level Wind Shaft and Gear Assembly (63); also bearing faces.

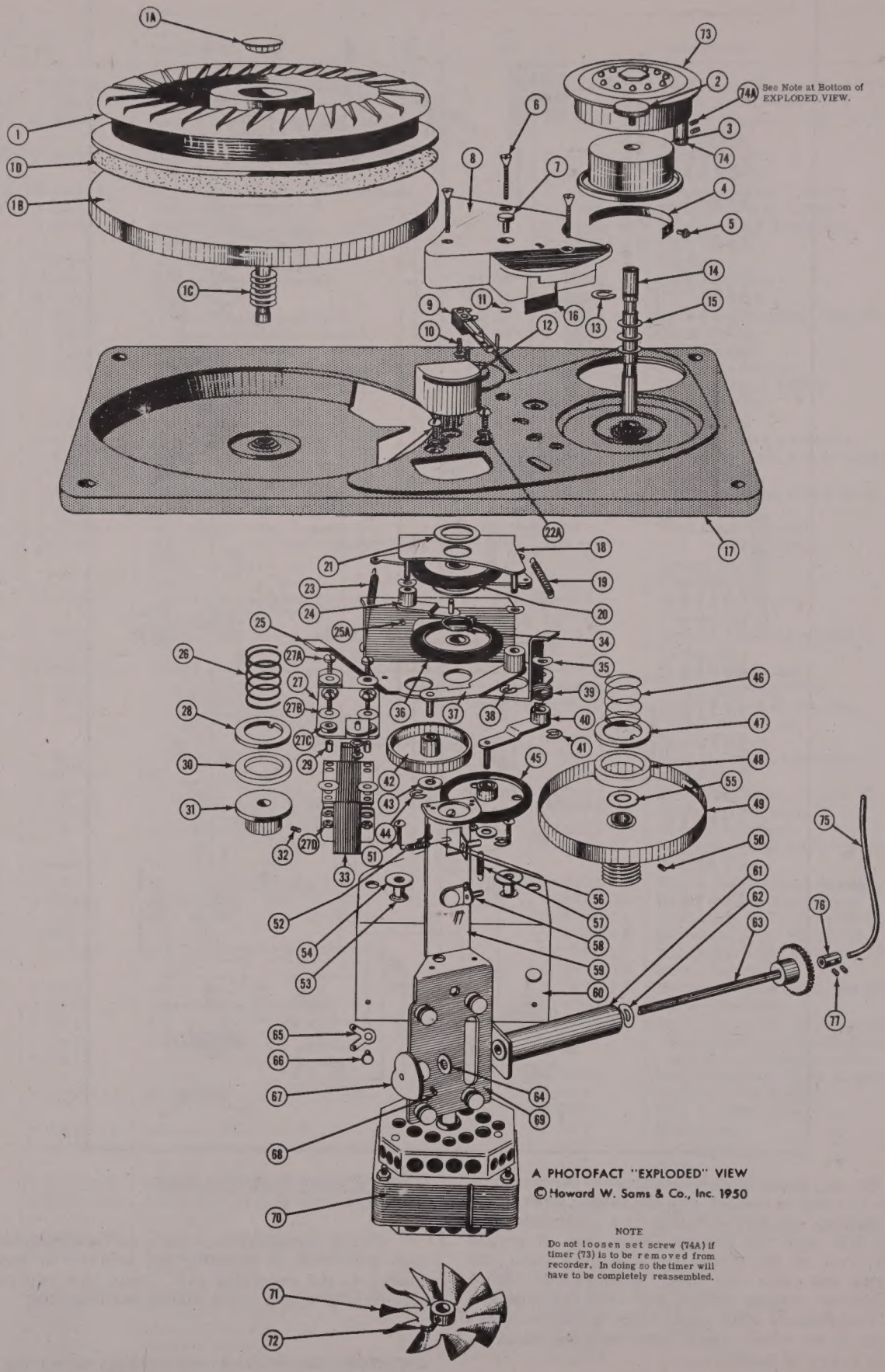
5. Level wind guides of the Frame and Housing Assembly (69).

6. Follower Assembly (58).

USE MACHINE OIL ON THE FOLLOWING:

1. The cam surface of the Level Wind Cam (67).

CAUTION: Pressed Oilite Bearings Do not require oil.



A PHOTOFACT "EXPLODED" VIEW

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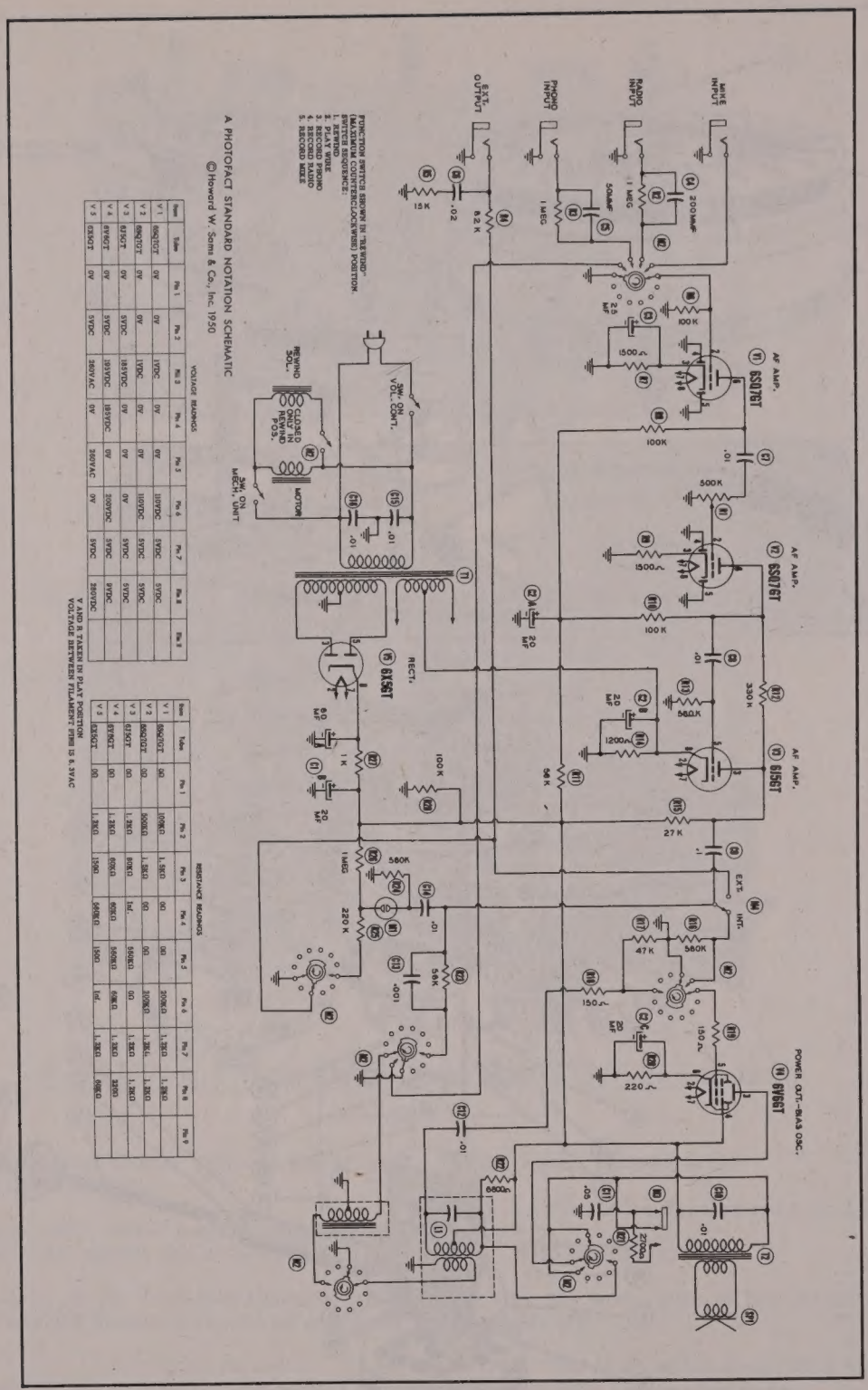
NOTE

Do not loosen set screw (74A) if timer (73) is to be removed from recorder. In doing so the timer will have to be completely reassembled.



Do not, under any circumstances, permit oil or grease to come in contact with the rubber tires of the Idler Pulleys and Drive Pulley; the Turntable rim; Pulley (42), and the Rewind Pulley (49). If grease and oil are on the rubber tires, replace them with new ones and clean the other surfaces with carbon tetrachloride, making certain that the surfaces are dried immediately after application of carbon tetrachloride as the rubber can be affected if the liquid is allowed to dry by itself.

Avoid overlubrication.

Cleaning of the Recording Head:

Weak reproduction, when not accompanied by high distortion, is probably due to dirt or foreign matter in the recording gap. Clean the gap with a stiff-bristle brush, using carbon tetrachloride.

CAUTION: Do not use any metallic object for this purpose.

Ref. No.	Part No.	Description
1	T-WR89	Upper Turntable Assembly
1A	Y-7W75	Plug Button
1B	Y-WR83	Lower Turntable Section and Shaft Assembly
1C	Y-5W27	Metal Shim Thrust Washer (As Req'd.)
1D	Y-1W126	Clutch Disc
2	Y-2W9	Hub Lock
3	Y-WR11	Rewind Hub Assembly - Consists of Items 3, 4, and 5
3	Y-3W3	Rewind Hub
4	Y-4W6	Spring
5	Y-2W19	Index Pin
	Y-2W20	Insert Hub (not exploded)
6	Y-6W6	6-32 x 1" Phillips O.H.M.S.
7	Y-3W4	Reset Button (Part of Item 8)
8	Y-WR27-2	Automatic Switch Assembly - Black (This assembly consists of Items 7, 8, 9, 10, and 11.)
8	Y-3W2-2	Switch Housing - only
9	Y-WR22	Switch
10	Y-6W11	Screw
11	Y-4W11	Retaining Spring
12	Y-WR37-2	Recording Head 4-prong
13	Y-5W3	Hub Thrust "C" Washer
14	Y-WR20	Rewind Hub Shaft Assembly
15	Y-5W27	Shim Thrust Washer - Metal (As Req'd.)
16		Insulator
17	Y-WR69-2	Motorboard and Bearing Assembly
18	Y-WR15	Bracket and Post Assembly
19	Y-4W20	Spring
20	Y-WR84-1	Pulley Assembly
	Y-2W47	50 Cycle Bushing
21	Y-5W11	Flat Washer
22	Y-6W5	8-32 x 3/8 R.H.M.S. Steel Cad. Plate
22A	Y-5W13	Lockwasher
23	Y-9W19-1	Spring
24	Y-WR14	Drive Link Assembly
25	Y-1W25	Bracket (Part of 17)
25A	Y-6W3	Adjusting Screw (8-32 x 5/8 R.H.M.S.)
26	Y-4W5	Turntable Spring
27	Y-1W51	Bracket (Part of Item 33)
27A	Y-6W221	#6-32 x 7/16" B. H. M. S.
27B	Y-5W203	#6 Flat Washer - 1/2" O. D.
27C	Y-7W57	Grommet
27D	Y-7W103	#6-32 Hex Nut - 1/4" Across Flat
28	Y-5W2	Keyed Washer
29	Y-2W61	Spacer (Part of Item 33)
30	Y-5W1	Felt Washer
31	Y-2W12	Spring Support
32	Y-6W12	8-32 x 1/4 Allen Head Set Screw
33	Y-WR70-1A	Solenoid Assembly (110 Volt, 60 Cycle AC)
	Y-8W37-1A	Solenoid (110 Volt, 60 Cycle AC)
	Y-WR70-1B	Solenoid Assembly (110 Volt, 50 Cycle AC)
	Y-8W37-2B	Solenoid (110 Volt, 50 Cycle AC)
	Y-WR70-1E	Solenoid Assembly (220 Volt, 60 Cycle AC)
	Y-8W38-1E	Solenoid (220 Volt, 60 Cycle AC)
	Y-WR70-1F	Solenoid Assembly (220 Volt, 50 Cycle AC)
	Y-8W38-2F	Solenoid (220 Volt, 50 Cycle AC)
	Y-7W57	Grommet (Item 27C)
	Y-2W61	Spacer (Item 29)
	Y-1W51	Bracket (Item 27)
	Y-6W221	#6-32 x 7/16 B.H.M.S. (Item 27A)
	Y-7W103	#6-32 Hex Nut - 1/4" Across Flat (Item 27D)
	Y-5W203	#6 Flat Washer - 1/2" O. D. (Item 27B)
34	Y-7W10	Retaining Ring
35	Y-5W8	Spring Washer
36	Y-WR85-1	60 Cycle Drive Pulley
	Y-WR85-2	50 Cycle Drive Pulley
37	Y-WR12	Movable Link Assembly
38	Y-5W20	"C" Washer
39	Y-4W12	Spring
40	Y-WR13	Link Assembly
41	Y-5W20	"C" Washer
42	Y-WR19	Pulley and Bushing Assembly
43	Y-5W7	Cloth Washer
44	Y-5W20	"C" Washer
45	Y-WR96	Pulley Assembly
46	Y-4W4	Rewind Pulley Spring
47	Y-5W2	Keyed Washer
48	Y-5W19	Felt Washer
49	Y-WR26	Rewind Pulley Assembly
50	Y-6W12	Set Screw (8-32 x 1/4" Allen Head)
51	Y-6W3	Motor Mounting Screw (8-32 x 5/8")
52	Y-6W7	4/40 x 1/4" Screw
53	Y-5W13	#8 I. T. Lockwasher
54	Y-2W66	Spacer Sleeve
55	Y-5W4	Fibre Washer
56	Y-4W8	Level Wind Spring
57	Y-4W7	Tension Spring
58	Y-WR33	Follower Assembly (Part of Item 59)
59	Y-WR31	Level Wind Frame
60	Y-WR82	Motor Mounting Plate
61	Y-2W23	Level Wind Shaft Housing (Part of Item 69)
62	Y-5W8	Spring Washer
63	Y-WR66	Gear and Shaft Assembly
64	Y-5W17	Flat Washer
65	Y-1W8	Solder Lug (Part of Item 70)
66	Y-7W112	Rivet (Part of Item 70)
67	Y-3W7	Level Wind Cam
68	Y-6W12	Set Screw (8-32 x 1/4" Allen Head)
69	Y-WR36	Frame and Housing Assembly
70	Y-WR88-1A	Motor and Plate Assembly
	Y-7W61-1A	Motor (110 Volt, 60 Cycle AC)
	Y-WR88-1B	Motor and Plate Assembly
	Y-7W61-1B	Motor (110 Volt, 50 Cycle AC)
	Y-WR88-1E	Motor Assembly
	Y-7W61-1E	Motor (220 Volt, 60 Cycle AC)
	Y-WR88-1F	Motor Assembly
	Y-7W61-1F	Motor (220 Volt, 50 Cycle AC) These motor assemblies consist of the following parts:
	Y-WR82	Motor Mounting Plate Assembly
	Y-6W3	#8-32 x 5/8 R.H.M.S.
	Y-5W13	#8 I. T. Lockwasher
	Y-1W8	Solder Lug
	Y-5W6	Lockwasher
	Y-7W2	Rivet
	Y-2W66	Spacer Sleeve
71	Y-7W225	Motor Fan
72	Y-6W12	Set Screw (8-32 x 1/4" Allen Head)
73	Y-TA-305-1	Timer
74	Y-2W306	Coupling
74A	Y-6W301	Set Screws 4/40
75	Y-7W224-3	Timer Cable
76	Y-2W306	Coupling
77	Y-6W301	Set Screw 4/40

ELECTRICAL PARTS LIST

Ref. No.	Part No.	Use and Description
V1	Y-10W107	6SQ7GT, AF Amplifier
V2	Y-10W107	6SQ7GT, AF Amplifier
V3	Y-10W108	6J5GT, AF Amplifier
V4	Y-10W103	6V6GT, Power Output - Bias Oscillator
V5	Y-10W104	6X5GT, Rectifier
C1A	Y-12W101	60 Mfd. @ 350 V., Filter, Electrolytic
C1B		20 Mfd. @ 300 V., Filter, Electrolytic
C2A	Y-12W110	20 Mfd. @ 300 V., Decoupling, Electrolytic
C2B		20 Mfd. @ 25 V., AF Cathode, Electrolytic
C2C		20 Mfd., @ 25V., Output Cathode, Electrolytic
C3	Y-12W102	25 Mfd. @ 25 V., AF Cathode, Electrolytic
C4	Y-8W103	200 Mmf. @ 500 V., Tone Compensation
C5	Y-12W115	50 Mmf. @ 500 V., Tone Compensation
C6	Y-12W116	.02 Mfd. @ 200 V., Tone Compensation
C7	Y-12W105	.01 Mfd. @ 400 V., Audio Coupling
C8	Y-12W105	.01 Mfd. @ 400 V., Audio Coupling
C9	Y-12W106	.1 Mfd. @ 400 V., Audio Coupling
C10	Y-12W105	.01 Mfd. @ 400 V., Output Bypass
C11	Y-12W104	.05 Mfd. @ 400 V., Tone Compensation
C12	Y-12W105	.01 Mfd. @ 400 V., Oscillator Coupling
C13	Y-12W114	.001 Mfd. @ 400 V., Tone Compensation
C14	Y-12W105	.01 Mfd. @ 400 V., Audio Coupling
C15	Y-12W105	.01 Mfd. @ 400 V., Line Filter
C16	Y-12W105	.01 Mfd. @ 400 V., Line Filter
R1	Y-11W203	500K Volume Control and Switch
R2	Y-11W102-5	1 Meg., 1/2 Watt, Tone Compensation
R3	Y-11W102-5	1 Meg., 1/2 Watt, Tone Compensation
R4	Y-11W102-24	82K Ohm, 1/2 Watt, Tone Compensation
R5	Y-11W102-25	15K Ohm, 1/2 Watt, Tone Compensation
R6	Y-11W102-8	100K Ohm, 1/2 Watt, AF Grid
R7	Y-11W102-1	1500 Ohm, 1/2 Watt, AF Cathode
R8	Y-11W102-8	100K Ohm, 1/2 Watt, AF Plate
R9	Y-11W102-1	1500 Ohm, 1/2 Watt, AF Cathode
R10	Y-11W102-8	100K Ohm, 1/2 Watt, AF Plate
R11	Y-11W102-9	56K Ohm, 1/2 Watt, Decoupling
R12	Y-11W102-20	330K Ohm, 1/2 Watt, Feedback
R13	Y-11W102-7	560K Ohm, 1/2 Watt, AF Grid
R14	Y-11W102-2	1200 Ohm, 1/2 Watt, AF Cathode
R15	Y-11W105-2	27K Ohm, 1 Watt, AF Plate
R16	Y-11W102-7	560K Ohm, 1/2 Watt, Audio Voltage Divider
R17	Y-11W102-11	47K Ohm, 1/2 Watt, Output Grid
R18	Y-11W102-21	150 Ohm, 1/2 Watt, Parasitic Suppressor
R19	Y-11W102-21	150 Ohm, 1/2 Watt, Parasitic Suppressor
R20		220 Ohm, 1 Watt, Output Cathode
R21	Y-11W102-16	2700 Ohm, 1/2 Watt, Tone Compensation
R22	Y-11W105-3	6800 Ohm, 1 Watt, Oscillator Coil Shunt
R23	Y-11W102-9	56K Ohm, 1/2 Watt, Tone Compensation
R24	Y-11W102-7.	560K Ohm, 1/2 Watt, Tone Compensation
R25	Y-11W102-13	220K Ohm, 1/2 Watt, Voltage Divider
R26	Y-11W102-5	1 Meg., 1/2 Watt, Voltage Divider
R27	Y-11W103-1	lK Ohm, 10 Watt, Filter
R28		100K Ohm, 2 Watt, Bleeder
T1	Y-13W103-2	Power Transformer
T2	Part of SP1	Output Transformer
SP1	Y-7W234	PM Speaker
SP2	Part of SP1	Speaker Cone
L1	Y-13W101-1	Oscillator Coil (30KC)
M1	Y-10W105	Neon Bulb (NE51)
M2	Y-7W117	Function Switch (Rotary)
M3	Y-7W118	Tone Switch
M4	Y-7W122	Internal-External